The Scottish Society of the History of Medicine

The H.P. Tait Collection

ZOONOMIA;

OR,

THE LAWS

OF

ORGANIC LIFE.

IN FOUR VOLUMES.

By ERASMUS DARWIN, M.D. F.R.S.

AUTHOR OF THE BOTANIC GARDEN.

Principiò cœlum, ac terras, campoſque liquentes,
Lucentemque globum lunæ, titaniaque aſtra,
Spiritus intùs alit, totamque infuſa per artus
Mens agitat molem, et magno ſe corpore miſcet.
VIRG. ÆN. vi.

Earth, on whoſe lap a thouſand nations tread,
And Ocean, brooding his prolific bed,
Night's changeful orb, blue pole, and ſilvery zones,
Where other worlds encircle other ſuns,
One mind inhabits, one diffuſive Soul
Wields the large limbs, and mingles with the whole.

VOL. IV.

THE THIRD EDITION, CORRECTED.

LONDON:
PRINTED FOR J. JOHNSON, IN ST. PAUL'S CHURCH YARD.
1801.

T. Bensley, Printer, Bolt Court, Fleet Street.

ZOONOMIA.

The Orders and Genera of the Third Claſs of Diſeaſes.

CLASS III.

DISEASES OF VOLITION.

ORDO I.

Increaſed Volition.

GENERA.

1. With increaſed actions of the muſcles.
2. With increaſed actions of the organs of ſenſe.

ORDO II.

Decreaſed Volition,

GENERA.

1. With decreaſed actions of the muſcles.
2. With decreaſed actions of the organs of ſenſe.

The Orders, Genera, and Species, of the Third Class of Diseases.

CLASS III.

DISEASES OF VOLITION.

ORDO I.

Increased Volition.

GENUS I.

With Increased Actions of the Muscles.

SPECIES.

1. *Jactitatio.*	Restlessness.
2. *Tremor febrilis.*	Febrile trembling.
3. *Clamor.*	Screaming.
4. *Risus.*	Laughter.
5. *Convulsio.*	Convulsion.
——— *debilis.*	——— weak.
6. ——— *dolorifica.*	——— painful.
7. *Epilepsia.*	Epilepsy.
8. ——— *dolorifica.*	——— painful.
9. *Somnambulismus.*	Sleep-walking.
10. *Asthma convulsivum.*	Asthma convulsive.
11. ——— *dolorificum.*	——— painful.

12. *Stridor*

12. *Stridor dentium.*	Gnaſhing of the teeth.
13. *Tetanus triſmus.*	Cramp of the jaw.
14. ——— *dolorificus.*	——— painful.
15. *Hydrophobia.*	Dread of water.

GENUS II.

With increaſed Actions of the Organs of Senſe.

SPECIES.

1. *Mania mutabilis.*	Mutable madneſs.
2. *Studium inane.*	Reverie.
3. *Vigilia.*	Watchfulneſs.
4. *Erotomania.*	Sentimental love.
5. *Amor ſui.*	Vanity.
6. *Noſtalgia.*	Deſire of home.
7. *Spes religioſa.*	Superſtitious hope.
8. *Superbia ſtemmatis.*	Pride of family.
9. *Ambitio.*	Ambition.
10. *Mœror.*	Grief.
11. *Tædium vitæ.*	Irkſomeneſs of life.
12. *Deſiderium pulchritudinis.*	Loſs of Beauty.
13. *Paupertatis timor.*	Fear of poverty.
14. *Lethi timor.*	——— of death.
15. *Orci timor.*	——— of Hell.
16. *Satyriaſis.*	Luſt.
17. *Ira.*	Anger.
18. *Rabies.*	Rage.
19. *Citta.*	Depraved appetite.

20. *Cacoſitia.*

20. *Cacoſitia.*	Averſion to food.
21. *Syphilis imaginaria.*	Imaginary pox.
22. *Pſora imaginaria.*	——— itch.
23. *Tabes imaginaria.*	——— tabes.
24. *Sympathia aliena.*	Pity.
25. *Educatio heroica.*	Heroic education.

ORDO II.

Decreaſed Volition.

GENUS I.

With decreaſed Actions of the Muſcles.

SPECIES.

1. *Laſſitudo.*	Fatigue.
2. *Vacillatio ſenilis.*	See-ſaw of old age.
3. *Tremor ſenilis.*	Tremor of old age.
4. *Brachiorum paralyſis.*	Palſy of the arms.
5. *Raucedo paralytica.*	Paralytic hoarſeneſs.
6. *Veſicæ urinariæ paralyſis.*	Palſy of the bladder.
7. *Recti paralyſis.*	Palſy of the rectum.
8. *Pareſis voluntaria.*	Voluntary debility.
9. *Catalepſis.*	Catalepſy.
10. *Hemiplegia.*	Palſy of one ſide.
11. *Paraplegia.*	Palſy of the lower limbs.
12. *Somnus.*	Sleep.
13. *Incubus.*	Night-mare.
14. *Lethargus.*	Lethargy.

15. *Syncope*

15. *Syncope epileptica.*	Epileptic fainting.
16. *Apoplexia.*	Apoplexy.
17. *Mors a frigore.*	Death from cold.

GENUS II.

With decreased Actions of the Organs of Sense.

SPECIES.

1. *Recollectionis jactura.*	Loss of recollection.
2. *Stultitia voluntaria.*	Voluntary folly.
3. *Credulitas.*	Credulity.

CLASS III.

DISEASES OF VOLITION.

ORDO I.

Increaſed Volition.

GENUS I.

Increaſed Actions of the Muſcles.

WE now ſtep forward to conſider the diſeaſes of volition, that ſuperior faculty of the ſenſorium, which gives us the power of reaſon, and by its facility of action diſtinguiſhes mankind from brute animals; which has effected all that is great in the world, and ſuperimpoſed the works of art on the ſituations of nature.

Pain is introduced into the ſyſtem either by exceſs or defect of the action of the part. (Sect. IV. 5.) Both which circumſtances ſeem to originate from the accumulation of ſenſorial power in the affected organ. Thus when the ſkin is expoſed to great cold, the activity of the cutaneous veſſels is diminiſhed, and in conſequence an accumulation of ſenſorial power obtains in them, becauſe they are uſually excited into inceſſant motion by the ſtimulus of heat, as explained in Sect. XII. 5. 2. Contrarywiſe, when the veſſels of the ſkin are expoſed to great heat, an exceſs of ſenſorial power is alſo produced in them, which

which is derived thither by the increaſe of ſtimulus above what is natural.

This accounts for the relief which is received in all kinds of pain by any violent exertions of our muſcles or organs of ſenſe; which may thus be in part aſcribed to the exhauſtion of the ſenſorial power by ſuch exertions. But this relief is in many caſes ſo inſtantaneous, that it ſeems nevertheleſs probable, that it is alſo in part owing to the different manner of progreſſion of the two ſenſorial powers of ſenſation and volition; one of them commencing at ſome extremity of the ſenſorium, and being propagated towards the central parts of it; and the other commencing in the central parts of the ſenſorium, and being propagated towards the extremities of it; as mentioned in Sect. XI. 2. 1.

Theſe violent voluntary exertions of our muſcles or ideas to relieve the ſenſation of pain conſtitute convulſions and madneſs; and are diſtinguiſhed from the muſcular actions owing to increaſed ſenſation, as in ſneezing, or coughing, or parturition, or ejectio ſeminis, becauſe they do not contribute to diſlodge the cauſe, but only to prevent the ſenſation of it. In two caſes of parturition, both of young women with their firſt child, I have ſeen general convulſions occur from exceſs of voluntary exertion, as above deſcribed, inſtead of the actions of particular muſcles, which ought to have been excited by ſenſation for the

exclusion of the fetus. They both became insensible, and died after some hours; from one of them the fetus was extracted in vain. I have heard also of general convulsions being excited instead of the actions of the musculi accelerators in the ejectio seminis, which terminated fatally. See Class III. 1. 1. 7.

These violent exertions are most frequently excited in consequence of those pains, which originate from defect of the action of the part. See Sect. XXXIV. 1. and 2. The pains from excess and defect of the action of the part are distinguishable from each other by the former being attended with increase of heat in the pained part, or of the whole body; while the latter not only exist without increase of heat in the pained part, but are generally attended with coldness of the extremities of the body.

As soon as these violent actions of our muscular or sensual fibres for the purpose of relieving pain cease to be exerted, the pain recurs; whence the reciprocal contraction and relaxation of the muscles in convulsion, and the intervals of madness. Otherwise these violent exertions continue, till so great a part of the sensorial power is exhausted, that no more of it is excitable by the faculty of volition; and a temporary apoplexy succeeds, with snoring as in profound sleep; which so generally terminates epileptic fits.

When these voluntary exertions become so

connected

connected with certain diſagreeable ſenſations, or with irritations, that the effort of the will cannot reſtrain them, they can no longer in common language be termed voluntary; but nevertheleſs belong to this claſs, as they are produced by exceſs of volition, and may ſtill not improperly be called depraved voluntary actions. See Sect. XXXIV. 1. where many motions in common language termed involuntary are ſhewn to depend on exceſs of volition.

When theſe exertions from exceſs of volition, which in common language are termed involuntary motions, either of mind or body, are perpetually exerted in weak conſtitutions, the pulſe becomes quick; which is occaſioned by the too great expenditure of the ſenſorial power in theſe unceaſing modes of activity. In the ſame manner as in very weak people in fevers, the pulſe ſometimes increaſes in frequency to 140 ſtrokes in a minute, when the patients ſtand up or endeavour to walk; and ſubſides to 110, when they lie down again in their beds. Whence it appears, that when a very quick pulſe accompanies convulſion or inſanity, it ſimply indicates the weakneſs of the patient; that is, that the expenditure of ſenſorial power is too great for the ſupply of it. But if the ſtrength of the patient is not previouſly exhauſted, the exertions of the muſcles are attended with temporary increaſe of circulation, the reciprocal ſwellings and elongations

tions of their bellies push forwards the arterial blood, and promote the absorption of the venous blood; whence a temporary increase of secretion and of heat, and a stronger pulse.

A correspondent acquaints me, that he finds difficulty in understanding how the convulsions of the limbs in epilepsy can be induced by voluntary exertions. This I suspect first to have arisen from the double meaning of the words "involuntary motions;" which are sometimes used for those motions, which are performed without the interference of volition, as the pulsations of the heart and arteries; and at other times for those actions, which occur, where two counter volitions oppose each other, and the stronger prevails; as in endeavouring to suppress laughter, and to stop the shudderings, when exposed to cold. Thus when the poet writes,

——— video meliora, proboque,
Deteriora sequor.———

The stronger volition actuates the system, but not without the counteraction of unavailing smaller ones; which constitute deliberation.

A second difficulty may have arisen from the confined use of the words "to will," which in common discourse generally mean to choose after deliberation; and hence our will or volition is supposed to be always in our own power. But the will or voluntary power, acts always from motive, as explained in Sect. XXXIV. 1. and in

Class

Clafs IV. 1. 3. 2. and III. 2. 1. 12. which motive can frequently be examined previous to action, and balanced againft oppofite motives, which is called deliberation; at other times the motive is fo powerful as immediately to excite the fenforial power of volition into action, without a previous balancing of oppofite motives, or counter volitions. The former of thefe volitions is exercifed in the common purpofes of life, and the latter in the exertions of epilepfy and infanity.

It is difficult *to think without words*, which however all thofe muft do, who difcover new truths by reafoning; and ftill more difficult, when the words in common ufe deceive us by their twofold meanings, or by the inaccuracy of the ideas, which they fuggeft.

SPECIES.

1. *Jactitatio.* Reftleffnefs. There is one kind of reftleffnefs attending fevers, which confifts in a frequent change of pofture to relieve the uneafinefs of the preffure of one part of the body upon another, when the fenfibility of the fyftem, or of fome parts of it, is increafed by inflammation, as in the lumbago; which may fometimes be diftinguifhed in its early ftage by the inceffant defire of the patient to turn himfelf in bed. But there is another reftleffnefs, which approaches towards writhing or contortions of the body,

body, which is a voluntary effort to relieve pain; and may be eſteemed a ſlighter kind of convulſion, not totally unreſtrainable by oppoſite or counteracting volitions.

Thus when a ſquirrel is confined in a cage, he feels uneaſineſs from the accumulation of ſenſorial power, in his muſcles, which were before in continual violent exertion in his habits of life; and in this ſituation finds relief by perpetually jumping about his cage to expend a part of this accumulated ſenſorial power.

For the ſame reaſon thoſe children, who are conſtrained to ſit in ſome ſchools for hours together, are liable to acquire habits of moving ſome muſcles of their faces, or hands, or feet, which are called tricks, to exhauſt a part of the accumulated ſenſorial power. Hence reſtleſſneſs is occaſioned by increaſe of ſtimulus, or by accumulation of ſenſorial power.

M. M. A bliſter. Opium. Warm bath. Bandage on the moving muſcles. See Convulſio debilis, Claſs III. 1. 1. 5. exerciſe.

2. *Tremor febrilis.* Reciprocal convulſions of the ſubcutaneous muſcles, originating from the pain of the ſenſe of heat, owing to defect of its uſual ſtimulus, and conſequent accumulation of ſenſorial power in it. The actual deficiency of heat may exiſt in one part of the body, and the pain of cold be felt moſt vividly in ſome other part aſſociated with it by ſenſitive ſympathy. So a

chillneſs down the back is firſt attended to in ague-fits, though the diſeaſe perhaps commences with the torpor and eonſequent coldneſs of ſome internal viſcus. But in whatever part of the ſyſtem the defect of heat exiſts, or the ſenſation of it, the convulſions of the ſubcutaneous muſcles exerted to relieve it are very general; and, if the pain is ſtill greater, a chattering of the teeth is added, the more ſuddenly to exhauſt the ſenſorial power, and becauſe the teeth are very ſenſible to eold.

Theſe convulſive motions are neverthefs reſtrainable by violent voluntary eounteraction; and as their intervals are owing to the pain of cold being for a time relieved by their exertion, they may be eompared to laughter, except that there is no interval of pleaſure preeeding each moment of pain in this as in the latter.

M. M. See I. 2. 2. 1.

3. *Clamor*. Screaming from pain. The talkative animals, as dogs, and ſwine, and ehildren, ſeream moſt, when they are in pain, and even from fear; as they have uſed this kind of exertion from their birth moſt frequently and moſt forcibly; and ean therefore ſooner exhauſt the accumulation of ſenſorial power in the affected muſcular or ſenſual organs by this mode of exertion; as deſcribed in Sect. XXXIV. 1. 3. This

facility

facility of relieving pain by ſcreaming is the ſource of laughter, as explained below.

4. *Riſus.* The pleaſurable ſenſations, which occaſion laughter, are perpetually paſſing into the bounds of pain; for pleaſure and pain are often produced by different degrees of the ſame ſtimulus; as warmth, light, aromatic or volatile odours, become painful by their exceſs; and the tickling on the ſoles of the feet in children is a painful ſenſation at the very time it produces laughter. When the pleaſurable ideas, which excite us to laugh, paſs into pain, we uſe ſome exertion, as a ſcream, to relieve the pain, but ſoon ſtop it again, as we are unwilling to loſe the pleaſure; and thus we repeatedly begin to ſcream, and ſtop again alternately. So that in laughing there are three ſtages, firſt of pleaſure, then pain, then an exertion to relieve that pain. See Sect. XXXIV. 1. 3.

Every one has been in a ſituation, where ſome ludicrous circumſtance has excited him to laugh; and at the ſame time a ſenſe of decorum has forbid the exertion of theſe interrupted ſcreams; and then the pain has become ſo violent, as to occaſion him to uſe ſome other great action, as biting his tongue, and pinching himſelf, in lieu of the reiterated ſcreams which conſtitute laughter.

5. *Convulſio.*

5. *Convulſio.* Convulſion. When the pains from defect or exceſs of motion are more diſtreſſing than thoſe already deſcribed, and are not relievable by ſuch partial exertions, as in ſcreaming, or laughter, more general convulſions occur; which vary perhaps according to the ſituation of the pained part, or to ſome previous aſſociations formed by the early habits of life. When theſe convulſive motions bend the body forwards, they are termed emproſthotonoi; when they bend it backward, they are termed opiſthotonoi. They frequently ſucceed each other, but the opiſthotonoi are generally more violent; as the muſcles, which erect the body, and keep it erect, are naturally in more conſtant and more forcible action than their antagoniſts.

The cauſes of convulſion are very numerous, as from toothing in children, from worms or acidity in their bowels, from eruption of the diſtinct ſmall-pox, and laſtly, from breathing too long the air of an unventilated bed-room. Sir G. Baker, in the Tranſactions of the College, deſcribed this diſeaſe, and detected its cauſe; where many children in an orphan-houſe were crowded together in one chamber without a chimney, and were almoſt all of them affected with convulſion; in the hoſpital at Dublin, many died of convulſions before the real cauſe was underſtood. See Dr. Beddoes's Guide to Self-preſervation. In a large family, which I attended,

tended, where many female servants slept in one room, which they had contrived to render inaccessible to every blast of air; I saw four who were thus seized with convulsions, and who were believed to have been affected by sympathy from the first who fell ill. They were removed into more airy apartments, but were some weeks before they all regained their perfect health.

Convulsion is distinguished from epilepsy, as the patient does not intirely lose all perception during the paroxysm. Which only shews, that a less exhaustion of sensorial power renders tolerable the pains which cause convulsion, than those which cause epilepsy. The hysteric convulsions are distinguished from those, owing to other causes, by the presence of the expectation of death, which precedes and succeeds them, and generally by a flow of pale urine; these convulsions do not constantly attend the hysteric disease, but are occasionally superinduced by the disagreeable sensation arising from the torpor or inversion of a part of the alimentary canal. Whence the convulsion of laughter is frequently sufficient to restrain these hysteric pains, which accounts for the fits of laughter frequently attendant on this disease.

M. M. To remove the peculiar pain which excites the convulsions. Venesection. An emetic. A cathartic with calomel. Warm-bath. Opium in large quantities, beginning with smaller ones.

Mercurial

Mercurial frictions. Electricity. Cold-bath in the paroxyſm; or cold aſperſion. See Memoirs of Med. Society, Lon. Vol. III. p. 147. a paper by Dr. Currie.

5. *Convulſio debilis.* The convulſions of dying animals, as of thoſe which are bleeding to death in the ſlaughter-houſe, are an effort to relieve painful ſenſation, either of the wound which occaſions their death, or of faintneſs from want of due diſtention of the blood-veſſels. Similar to this in a leſs degree is the ſubſultus tendinum, or ſtarting of the tendons, in fevers with debility; theſe actions of the muſcles are too weak to move the limb, but the belly of the acting muſcles is ſeen to ſwell, and the tendon to be ſtretched. Theſe weak convulſions, as they are occaſioned by the diſagreeable ſenſation of faintneſs from inanition, are ſymptoms of great general debility, and thence frequently precede the general convulſions of the act of dying. See a caſe of convulſion of a muſcle of the arm, and of the fore-arm, without moving the bones to which they were attached, Sect. XVII. 1. 8. See twitchings of the face, Claſs IV. 1. 3. 2.

6. *Convulſio dolorifica.* Raphania. Painful convulſion. In this diſeaſe the muſcles of the arms and legs are exerted to relieve the pains left after the rheumatiſm in young and delicate people; it

recurs once or twice a day, and has been mistaken for the chorea, or St. Vitus's dance; but differs from it, as the undue motions in that disease only occur, when the patient endeavours to exert the natural ones; are not attended with pain; and cease, when he lies down without trying to move: the chorea, or dance of St. Vitus, is often introduced by the itch, this by the rheumatism.

It has also been improperly called nervous rheumatism; but is distinguished from rheumatism, as the pains recur by periods once or twice a day; whereas in the chronic rheumatism they only occur on moving the affected muscles. And by the warmth of a bed the pains of the chronic rheumatism are increased, as the muscles or membranes then become more sensible to the stimulus of the extraneous mucaginous material deposited under them. Whereas the pains of the raphania, or painful convulsion, commence with coldness of the part, or of the extremities. See Rheumatismus chronicus. Class I. 1. 3. 12.

The pains which accompany the contractions of the muscles in this disease, seem to arise from the too great violence of those contractions, as happens in the cramp of the calf of the leg; from which they differ in those being fixed, and these being reiterated contractions. Thus these convulsions are generally of the lower limbs, and recur at periodical times from some

uneasy

uneasy sensation from defect of action, like other periodic diseases; and the convulsions of the limbs relieve the original uneasy painful sensation, and then produce a greater pain from their own too vehement contractions. There is however another way of accounting for these pains, when they succeed the acute rheumatism; and that is by the coagulable lymph, which may be left still unabsorbed on the membranes; and which may be in too small quantity to affect them with pain in common muscular exertions, but may produce great pain, when the bellies of the muscles swell to a larger bulk in violent action.

M. M. Venesection. Calomel. Opium. Bark. One grain of calomel and one of opium for ten successive nights. A bandage spread with emplastrum de minio put tight on the affected part.

7. *Epilepsia* is originally induced, like other convulsions, by a voluntary exertion to relieve some pain. This pain is most frequently about the pit of the stomach, or termination of the bile-duct; and in some cases the torpor of the stomach, which probably occasioned the epileptic fits, remains afterwards, and produces a chronical anorexia; of which a case is related in Class II. 2. 2. 1. There are instances of its beginning in the heel, of which a case is published by Dr. Short, in the Med. Essays, Edinb. I once saw a child about ten years old, who frequently

fell down in convulſions, as ſhe was running about in play; on examination a wart was found on one ancle, which was ragged and inflamed; which was directed to be cut off, and the fits never recurred.

When epilepſy firſt commences, the patients are liable to utter one ſcream before they fall down; afterwards the convulſions ſo immediately follow the pain, which occaſions them, that the patient does not recollect or ſeem ſenſible of the preceding pain. Thus in laughter, when it is not exceſſive, a perſon is not conſcious of the pain, which ſo often recurs, and cauſes the ſucceſſive ſcreams or exertions of laughter, which give a temporary relief to it.

Epileptic fits frequently recur in ſleep from the increaſe of ſenſibility at that time, explained in Sect. XVIII. 14. In two ſuch caſes, both of young women, one grain of opium given at night, and continued many months, had ſucceſs; in one of them the opium was omitted twice at different times, and the fit recurred on both the nights. In the more violent caſe, deſcribed in Sect. XVIII. 15, opium had no effect.

Epileptic fits generally commence with ſetting the teeth, by which means the tongue is frequently wounded; and with rolling the eye-balls in every kind of direction; for the muſcles which ſuſpend the jaw, as well as thoſe which move the eyes, are in perpetual motion during our waking

ing hours; and yet continue ſubſervient to volition; hence their more facile and forcible actions for the purpoſe of relieving pain by the exhauſtion of ſenſorial power. See Section XXXIV. 1. 4.

Epileptic convulſions are not attended with the fear of death, as in the hyſteric diſeaſe, and the urine is of a ſtraw colour. However it muſt be noted, that the diſagreeable ſenſations in hyſteric diſeaſes ſometimes are the cauſe of true epileptic convulſions, of ſyncope, and of madneſs.

The pain, which occaſions ſome fits of epilepſy, is felt for a time in a diſtant part of the ſyſtem, as in a toe or heel; and is ſaid by the patient gradually to aſcend to the head, before the general convulſions commence. This aſcending ſenſation has been called aura epileptica, and is ſaid to have been prevented from affecting the head by a tight bandage round the limb. In this malady the pain, probably of ſome torpid membrane, or diſeaſed tendon, is at firſt only ſo great as to induce ſlight ſpaſms of the muſcular fibres in its vicinity; which ſlight ſpaſms ceaſe on the numbneſs introduced by a tight bandage; when no bandage is applied, the pain gradually increaſes, till general convulſions are exerted to relieve it. The courſe of a lymphatic, as when poiſonous matter is abſorbed; or of a nerve, as in the ſciatica, may, by the ſympathy exiſting

between their extremities and origins, give an idea of the aſcent of an aura or vapour.

In difficult parturition it ſometimes happens, that general convulſions are excited to relieve the pain of labour, inſtead of the exertions of thoſe muſcles of the abdomen and diaphragm, which ought to forward the excluſion of the child. See Claſs III. 1. 1. That is, inſtead of the particular muſcular actions, which ought to be excited by ſenſation to remove the offending cauſe, general convulſions are produced by the power of volition, which ſtill the pain, as in common epilepſy, without removing the cauſe; and, as the parturition is not thus promoted, the convulſions continue, till the ſenſorial power is totally exhauſted, that is, till death. In patients afflicted with epilepſy from other cauſes, I have ſeen the moſt violent convulſions recur frequently during pregnancy without miſcarriage; as they did not tend to forward the excluſion of the fetus.

Pains of this kind have been called falſe pains by ſome writers on midwifery, and are directed to be relieved by an opiate, and then they ſay the true pains will commence. M. Daventer directs the accoucheur to attend to the os tincæ, to diſtinguiſh them from each other, which dilates with every true pain, but contracts with every falſe one, that is, the voluntary actions of other

muſcles

muſcles to relieve pain are attended with thoſe of the os uteri, as mentioned in Genus I. of this Claſs and Order preceding the deſcriptions of the Species.

M. M. Veneſection. A large doſe of opium. Delivery.

The later in life epileptic fits are firſt experienced, the more dangerous they may be eſteemed in general; as in theſe caſes the cauſe has generally been acquired by the habits of the patient, or by the decay of ſome part, and is thus probably in an increaſing ſtate. Whereas in children the change in the ſyſtem, as they advance to puberty, ſometimes removes the cauſe. So in toothing, fits of convulſion with ſtupor frequently occur, and ceaſe when the tooth advances; but this is not to be expected in advanced life. Sir —— ——, about ſixty years of age, had only three teeth left in his upper jaw, a canine tooth, and one on each ſide of it. He was ſeized with epileptic fits, with pain commencing in theſe teeth. He was urged to have them extracted, which he delayed too long, till the fits were become habitual, and then had them extracted in vain, and in a few months ſunk under the diſeaſe.

Mr. H. M. was ſeized with pain in the adductor muſcle of the right thumb, and had epileptic convulſions in conſequence; theſe gradually increaſed in ſtrength and frequency; a bandage on the arm, drawn very tight as ſoon as the pain

of the ball of the thumb commenced, prevented the epileptic fits, I ſuppoſe by leſſening the pain by the numbneſs occaſioned by compreſſing the nerve. I adviſed the nerves of this muſcle to be cut, which was done or attempted, and was ſuppoſed for a time to have cured the diſeaſe, as I was informed. Afterwards it recurred and deſtroyed the patient, who might have probably been ſaved by the loſs of a hand, which I ſhould have adviſed, but was not again conſulted.

I have to add, that the tic douloureux, or hemicrania idiopathica, I believe to be a diſeaſe of this kind, owing to a torpor of the extremity of ſome branch of a nerve, and ſhould recommend, when the nerve cannot be biſected, to paſs through it for many hours or even days, a current of galvanic electricity from Volta's pillar of zinc, and ſilver, and cloth moiſtened with ſalt and water.

Mr. F——, who had lived intemperately, and had been occaſionally affected with the gout, was ſuddenly ſeized with epileptic fits; the convulſions were ſucceeded by apoplectic ſnoring; from which he was, in about 20 minutes, diſturbed by freſh convulſions, and had continued in this ſituation above four-and-twenty hours. About eight ounces of blood were then taken from him: and after having obſerved, that the apoplectic torpor continued about 20 minutes, I directed him to be forcibly raiſed up in bed,

after

after he had thus lain about fifteen minutes, to gain an interval between the termination of the ſleep, and the renovation of convulſion. In this interval he was induced to ſwallow forty drops of laudanum. Twenty more were given him in the ſame manner in about half an hour, both which evidently ſhortened the convulſion fits, and the conſequent ſtupor; he then took thirty more drops, which for the preſent removed the fits. He became rather inſane the next day, and after about three more days loſt the inſanity, and recovered his uſual ſtate of health.

The caſe mentioned in Sect. XXVII. 2. where the patient was left after epileptic fits with a ſuffuſion of blood beneath the tunica adjunctiva of the eye, was in almoſt every reſpect ſimilar to the preceding, and ſubmitted to the ſame treatment. Both of them ſuffered frequent relapſes, which were relieved by the ſame means, and at length periſhed, I believe, by the epileptic fits.

In thoſe patients, who have not been ſubject to epilepſy before they have arrived to about forty years of age, and who have been intemperate in reſpect to ſpirituous potation, I have been induced to believe, that the fits were occaſioned by the pain of a diſeaſed liver; and this became more probable in one of the above ſubjects, who had uſed means to repel eruptions on the face; and thus by ſome ſtimulant application had prevented an inflammation taking

place on the ſkin of the face inſtead of on ſome part of the liver. Secondly, as in theſe caſes insanity had repeatedly occurred, which could not be traced from an hereditary ſource; there is reaſon to believe, that this as well as the epileptic convulſions were cauſed by ſpirituous potation; and that this therefore is the original ſource both of epilepſy and of inſanity in thoſe families, which are afflicted with them. This idea however brings ſome conſolation with it; as it may be inferred, that in a few ſober generations theſe diſeaſes may be eradicated, which otherwiſe deſtroy the family.

M. M. Veneſection. Opium. Bark. Steel. Arſenic. Opium one grain twice a day for years together. See the preceding article, and the ſucceeding one.

Anorexia epileptica, as mentioned in Claſs II. 2. 2. 1. is a dreadful diſeaſe, originating, I believe, from a paralyſis of the ſtomach, and generally occaſioned by the application of great external cold to the ſkin. A young lady, whom I ſaw yeſterday, who had long experienced a weak ſtate of health, went to church on an uncommonly cold Sunday, when the thermometer was ſaid to ſtand below 20 during the whole day. She became immediately indiſpoſed, and was ſeized in a day or two with tremors and convulſions in her ſleep; and which returned every two or three days. Her extremities are now always uncommonly cold,

cold, and her appetite to food totally defective. She took three drops of a ſaturated ſolution of arſenic and a bitter draught twice a day for a fortnight, and gradually recovered her former ſtate of health.

Another young lady, whom I lately ſaw, began to ſtart ſomewhat like a violent hiccough many times in an hour, after uſing a very cold ſhower-bath repeatedly. This had continued daily at uncertain times for many months, and received temporary advantage from one drop of oil of cinnamon, three or four times a day, on powdered ſugar; this caſe belongs to convulſion rather than epilepſy, but was attended, like the former, with great defect of appetite. In both theſe caſes I ſuſpect, that the great torpor of the ſtomach was cauſed by too violent or too long continued coldneſs applied to the ſkin; whence the ſenſorial power of aſſociation, which ought to have been excited by the action of the cutaneous veſſels, and to have then contributed to the action of the ſtomach, did not exiſt; and that the ſtomach in conſequence became torpid. See Suppl. I. 14. 3. and Art. IV. 2. 6. 8. and Claſs III. 2. 1. 17.

Dr. Wilſon, of Spalding, has lately much recommended the argentum nitratum in epilepſy; he gives two grains and a half three times a day, mixed with bread crumbs into pills, as he aſſerts, with

with the happieſt ſucceſs. Annals of Medicine, 1797.

8. *Epilepſia dolorifica.* Painful epilepſy. In the common epilepſy the convulſions are immediately induced, as ſoon as the diſagreeable ſenſation, which cauſes them, commences; but in this the pain continues long with cold extremities, gradually increaſing for two or three hours, till at length convulſions or madnéſs come on; which terminate the daily paroxyſm, and ceaſe themſelves in a little time afterwards.

This diſeaſe ſometimes originates from a pain about the lower edge of the liver, ſometimes in the temple, and ſometimes in the pudendum; it recurs daily for five or ſix weeks, and then ceaſes for ſeveral months. The pain is owing to defect of action, that is, to the accumulation of ſenſorial power in the part, which probably ſympathizes with ſome other part, as explained in Sect. XXXV. 2. XII. 5. 3. and Claſs II. 1. 1. 11. and IV. 2. 2. 3.

It is the moſt painful malady that human nature is liable to!—See Sect. XXXIV. 1. 4.

Mrs. C—— was ſeized every day about the ſame hour with violent pain on the right ſide of her bowels about the ſituation of the lower edge of the liver, without fever, which increaſed for an hour or two, till it became totally intolerable.

After

After violent ſcreaming ſhe fell into convulſions, which terminated ſometimes in fainting, with or without ſtertor, as in common epilepſy; at other times a temporary inſanity ſupervened; which continued about half an hour, and the fit ceaſed. Theſe paroxyſms had returned daily for two or three weeks, and were at length removed by large doſes of opium, like the fits of reverie or ſomnambulation. About half an hour before the expected return of the fit three or four grains of opium were exhibited, and then tincture of opium was given in warm brandy and water about twenty or thirty drops every half hour, till the eyes became ſomewhat inflamed, and the noſe began to itch, and by the ſharp movements of the patient, or quick ſpeech, an evident intoxication appeared; and then it generally happened that the pain ceaſed. But the effects of this large doſe of opium was ſucceeded by perpetual ſickneſs and efforts to vomit, with great general debility all the ſucceeding day.

The rationale of this temporary cure from the exhibition of opium and vinous ſpirit depends on the great expenditure of ſenſorial power in the increaſed actions of all the irritative motions; by the ſtimulus of ſuch large quantities of opium and vinous ſpirit; together with the production of much ſenſation, and many movements of the organs of ſenſe or ideas in conſequence of that ſenſation; and laſtly, even the motions of the

arterial

arterial ſyſtem become accelerated by this degree of intoxication, all which ſoon exhauſted ſo much ſenſorial power as to relieve the pain; which would otherwiſe have cauſed convulſions or inſanity, which are other means of expending ſenſorial power. The general debility on the ſucceeding day, and the particular debility of the ſtomach, attended in conſequence with ſickneſs and frequent efforts to vomit, were occaſioned by the ſyſtem having previouſly been ſo ſtrongly ſtimulated, and thoſe parts in particular on which the opium and wine more immediately acted. This ſickneſs continued ſo many hours as to break the catenation of motions, which had daily reproduced the paroxyſm; and thus it generally happened, that the whole diſeaſe ceaſed for ſome weeks or months from one great intoxication, a circumſtance not eaſily to be explained on any other theory.

The exceſs or defect of motion in any part of the ſyſtem occaſions the production of pain in that part, as in Sect. XII. 1. 6. This defect or exceſs of fibrous action is generally induced by exceſs or defect of the ſtimulus of objects external to the moving organ. But there is another ſource of exceſſive fibrous action, and conſequent pain, which is from exceſs of volition, which is liable to effect thoſe muſcles, that have weak antagoniſts; as thoſe which ſupport the under jaw, and cloſe the mouth in biting, and thoſe of the

calf

calf of the leg; which are thus liable to fixed or painful contractions, as in trifmus, or locked jaw, and in the cramp of the calf of the leg; and perhaps in fome colics, as in that of Japan: thefe pains, from contraction arifing from excefs of volition in the part from the want of the counteraction of antagonift mufcles, may give occafional caufe to epileptic fits, and may be relieved in the fame way, either by exciting irritative and fenfitive motions by the ftimulus of opium and wine; or by convulfions or infanity, as defcribed above, which are only different methods of exhaufting the general quantity of fenforial power.

Confidering the great refemblance between this kind of painful epilepfy and the colic of Japan, as defcribed by Kæmpfer; and that that difeafe was faid to be cured by acupuncture, or the prick of a needle; I directed fome very thin fteel needles to be made about three inches long, and of fuch a temper, that they would bend double rather than break; and wrapped wax thread over about half an inch of the blunt end for a handle. One of thefe needles, when the pain occurred, was pufhed about an inch into the painful part, and the pain inftantly ceafed; but I was not certain, whether the fear of the patient, or the ftimulus of the puncture, occafioned the ceffation of pain; and as the paroxyfm had continued fome weeks, and was then declining, the experiment was not tried again. The difeafe is faid to be very fre-

quent in Japan, and its ſeat to be in the bowels, and that the acupuncture eliminates the air, which is ſuppoſed to diſtend the bowel. But though the aperture thus made is too ſmall to admit of the eduction of air; yet as the ſtimulus of ſo ſmall a puncture may either excite a torpid part into action, or cauſe a ſpaſmodic one to ceaſe to act; and laſtly, as no injury could be likely to enſue from ſo ſmall a perforation, I ſhould be inclined at ſome future time to give this a fairer trial in ſimilar circumſtances.

Another thing worth trial at the commencement of this deplorable diſeaſe would be electricity, by paſſing ſtrong ſhocks through the painful part; which, whether the pain was owing to the inaction of that part, or of ſome other membrane aſſociated with it, might ſtimulate them into exertion; or into inactivity, if owing to fixed painful contraction.

And laſtly, the cold bath, or aſperſions with cold water on the affected part, according to the method of Dr. Currie in the Memoirs of a Med. Soc. London, Vol. III. p. 147, might produce great effect at the commencement of the pain. Nevertheleſs opium duly adminiſtered, ſo as to precede the expected paroxyſm, and in ſuch doſes, given by degrees, as to induce intoxication, is principally to be depended upon in this deplorable malady. To which ſhould be added, that if veneſection can be previouſly performed, even to

but

but few ounces, the effect of the opium is much more certain; and ſtill more ſo, if there be time to premiſe a briſk cathartic, or even an emetic. The effect of increaſed ſtimulus is ſo much greater after previous defect of ſtimulus; and this is ſtill of greater advantage, where the cauſe of the diſeaſe happens to conſiſt in a material, which can be abſorbed. See Art. IV. 2. S.

M. M. Veneſection. An emetic. A cathartic. Warm bath. Opium a grain every half hour. Wine. Spirit of wine. If the patient becomes intoxicated by the above means, the fit ceaſes, and violent vomitings and debility ſucceed on the ſubſequent day, and prevent a return. Bliſters or ſinapiſms on the ſmall of the leg, taken off when they give much pain, are of uſe in ſlighter convulſions. Acupuncture. Electricity. Aſperſion with cold water on the painful part. A bag of ſnow or ice applied on the pained part.

9. *Somnambuliſmus.* Sleep-walking is a part of reverie, or ſtudium inane, deſcribed in Sect. XIX. In this malady the patients have only the general appearance of being aſleep in reſpect to their inattention to the ſtimulus of external objects, but, like the epilepſies above deſcribed, it conſiſts in voluntary exertions to relieve pain. The muſcles are ſubſervient to the will, as appears by the patient's walking about, and ſometimes doing the common offices of life. The ideas of the

mind alſo are obedient to the will, becauſe the patient's diſcourſe is conſiſtent, though he anſwers imaginary queſtions. The irritative ideas of external objects continue in this malady, becauſe the patients do not run againſt the furniture of the room; and when they apply their volition to their organs of ſenſe, they become ſenſible of the objects they attend to, but not otherwiſe, as general ſenſation is deſtroyed by the violence of their voluntary exertions. At the ſame time the ſenſations of pleaſure in conſequence of ideas excited by volition are vividly experienced, and other ideas ſeem to be excited by theſe pleaſurable ſenſations, as appears in the caſe of Maſter A. Sect. XXXIV. 3. 1. where a hiſtory of a hunting ſcene was voluntarily recalled, with all the pleaſurable ideas which attended it. In melancholy madneſs the patient is employed in voluntarily exciting one idea, with thoſe which are connected with it by voluntary aſſociations only, but not ſo violently as to exclude the ſtimuli of external objects. In reverie variety of ideas are occaſionally excited by volition, and thoſe which are connected with them either by ſenſitive or voluntary aſſociations, and that ſo violently as to exclude the ſtimuli of external objects. Theſe two ſituations of our ſenſual motions, or ideas, reſemble convulſion and epilepſy; as in the former the ſtimulus of external objects is ſtill perceived, but not in the latter.

Whence this diſeaſe, ſo far from being connected with ſleep, though it has by univerſal miſtake acquired its name from it, ariſes from exceſs of volition, and not from a ſuſpenſion of it; and though, like other kinds of epilepſy, it often attacks the patients in their ſleep, yet thoſe two, whom I ſaw, were more frequently ſeized with it while awake, the ſleep-walking being a part of the reverie. See Sect. XIX. and XXXIV. 3. and Claſs II. 1. 7. 4. and III. 1. 2. 18.

M. M. Opium in large doſes before the expected paroxyſm.

10. *Aſthma convulſivum.* The fits of convulſive aſtma return at periods, and are attended with cold extremities, and ſo far reſemble the acceſs of an intermittent fever; but, as the lungs are not ſenſible to the pain of cold, a ſhivering does not ſucceed, but inſtead of it violent efforts of reſpiration; which have no tendency, as in the humoral aſthma, to diſlodge any offending material, but only to relieve the pain by exertion, like the ſhuddering in the beginning of ague-fits, as explained Claſs III. 1. 1. 2.

The inſenſibility of the lungs to cold is obſervable on going into froſty air from a warm room; the hands and face become painfully cold, but no ſuch ſenſation is excited in the lungs; which is another argument in favour of the exiſtence of a peculiar ſet of nerves for the pur-

pofe of perceiving the univerfal fluid matter of heat, in which all things are immerfed. See Sect. XIV. 6. Yet are the lungs nevertheleſs very fenſible to the deficiency of oxygen in the atmofphere, as all people experience, when they go into a room crowded with company and candles, and complain, that it is fo clofe, they can fcarcely breathe; and the fame in fome hot days in fummer.

There are two difeafes, which bear the name of afthma. The firft is the torpor or inability of the minute veffels of the lungs, confifting of the terminations of the pulmonary and bronchial arteries and veins, and their attendant lymphatics; in this circumftance it refembles the difficulty of breathing, which attends cold bathing. If this continues long, a congeftion of fluid in the air-cells fucceeds, as the abforbent actions ceafe completely before the fecerning ones; as explained in Clafs I. 1. 2. 3. And the coldnefs, which attends the inaction of thefe veffels, prevents the ufual quantity of exhalation. Some fits ceafe before this congeftion takes place, and in them no violent fweating nor any expuition of phlegm occurs. This is the humoral afthma, defcribed at Clafs II. 1. 1. 7.

The fecond kind of afthma confifts in the convulfive actions in confequence of the difagreeable fenfations thus induced; which in fome fits of afthma are very great, as appears in the

the violent efforts to raiſe the ribs, and to depreſs the diaphragm, by lifting the ſhoulders. Theſe, ſo long as they contribute to remove the cauſe of the diſeaſe, are not properly convulſions, but exertions immediately cauſed by ſenſation; but in this kind of aſthma they are only efforts to relieve pain, and are frequently preceded by other epileptic convulſions.

Theſe two kinds of aſthma have ſo many reſembling features, and are ſo frequently intermixed, that it often requires great attention to diſtinguiſh them; but as one of them is allied to anaſarca, and the other to epilepſy, we ſhall acquire a clearer idea of them by comparing them with thoſe diſorders. A criterion of the humoral or hydropic aſthma is, that it is relieved by copious ſweats about the head and breaſt, which are to be aſcribed to the ſenſitive exertions of the pulmonary veſſels to relieve the pain occaſioned by the anaſarcous congeſtion in the air-cells; and which is effected by the increaſed abſorption of the mucus, and its elimination by the retrograde action of thoſe lymphatics of the ſkin, the branches of which communicate with the pulmonary ones; and which partial ſweats do not eaſily admit of any other explanation. See Claſs I. 3. 2. 8. Another criterion of it is, that it is generally attended with ſwelled legs, or other ſymptoms of anaſarca. A criterion of the convulſive aſthma may be had from the abſence of theſe cold clammy

ſweats of the upper part of the body only, and from the patient having occaſionally been ſubject to convulſions of the limbs, as in the common epilepſy.

It may thus frequently happen, that in the humoral aſthma ſome exertions of the lungs may occur, which may not contribute to diſcharge the anaſarcous lymph, but may be efforts ſimply to relieve pain; beſides thoſe efforts, which produce the increaſed abſorption and elimination of it; and thus we have a bodily diſeaſe reſembling in this circumſtance the reverie, in which both ſenſitive and voluntary motions are at the ſame time, or in ſucceſſion, excited for the purpoſe of relieving pain.

It may likewiſe ſometimes happen, that the diſagreeable ſenſation, occaſioned by the congeſtion of lymph in the air-cells in the humoral or hydropic aſthma, may induce voluntary convulſions of the reſpiratory organs only to relieve the pain, without any ſenſitive actions of the pulmonary abſorbents to abſorb and eliminate the congeſtion of ſerous fluid; and thus the ſame cauſe may occaſionally induce either the humoral or convulſive aſthma.

The humoral aſthma has but one remote cauſe, which is the torpor of the pulmonary veſſels, like that which occurs on going into the cold bath; or the want of abſorption of the pulmonary lymphatics to take up the lymph effuſed

into

into the air-cells. Whereas the convulſive aſthma, like other convulſions, or epilepſies, may be occaſioned by pain in almoſt any remote part of the ſyſtem. But in ſome of the adult patients in this diſeaſe, as in many epilepſies, I have ſuſpected the remote cauſe to be a pain of the liver, or of the biliary ducts.

The aſthmas, which have been induced in conſequence of the receſs of eruptions, eſpecially of the leprous kind, countenance this opinion. One lady I knew, who for many years laboured under an aſthma, which ceaſed on her being afflicted with pain, ſwelling, and diſtortion of ſome of her large joints, which were eſteemed gouty, but perhaps erroneouſly. And a young man, whom I ſaw yeſterday, was ſeized with aſthma on the retroceſſion, or ceaſing of eruptions on his face.

The convulſive aſthma, as well as the hydropic, is more liable to return in hot weather; which may be occaſioned by the leſs quantity of oxygen exiſting in a given quantity of warm air, than of cold, which can be taken into the lungs at one inſpiration. They are both moſt liable to occur after the firſt ſleep, which is therefore a general criterion of aſthma. The cauſe of this is explained in Sect. XVIII. 15. and applies to both of them, as our ſenſibility to internal uneaſy ſenſation increaſes during ſleep.

When children are gaining teeth, long before they appear, the pain of the gums often induces

convulſions. This pain is relieved in ſome by ſobbing and ſcreaming; but in others a laborious reſpiration is exerted to relieve the pain; and this conſtitutes the true aſthma convulſivum. In other children again general convulſions, or epileptic paroxyſms, are induced for this purpoſe; which, like other epilepſies, become eſtabliſhed by habit, and recur before the irritation has time to produce the painful ſenſation, which originally cauſed them.

The aſthma convulſivum is alſo ſometimes induced by worms, or by acidity in the ſtomachs of children, and by other painful ſenſations in adults; in whom it is generally called nervous aſthma, and is often joined with other epileptic ſymptoms.

This aſthma is diſtinguiſhed from the peripneumony, and from the croup, by the preſence of fever in the two latter. It is diſtinguiſhed from the humoral aſthma, as in that the patients are more liable to run to the cold air for relief, are more ſubject to cold extremities, and experience the returns of it more frequently after their firſt ſleep. It is diſtinguiſhed from the hydrops thoracis, as that has no intervals, and the patient ſits conſtantly upright, and the breath is colder; and, where the pericardium is affected, the pulſe is quick and unequal. See Hydrops Thoracis, I. 2. 3. 14.

M. M. Veneſection once. A cathartic with calomel

calomel once. Opium. Asafætida. Warm bath. If the cause can be detected, as in toothing or worms, it should be removed. As this species of asthma is so liable to recur during sleep, like epileptic fits, as mentioned in Section XVIII. 15. there was reason to believe, that the respiration of an atmosphere mixed with hydrogen, or any other innocuous air, which might dilute the oxygen, would be useful in preventing the paroxysms by decreasing the sensibility of the system. This, I am informed by Dr. Beddoes, has been used with decided success by Dr. Ferriar. See Class II. 1. 1. 7.

11. *Asthma dolorificum.* Angina pectoris. The painful asthma was first described by Dr. Heberden in the Transactions of the College; its principal symptoms consist in a pain about the middle of the sternum, or rather lower, on every increase of pulmonary or muscular exertion, as in walking faster than usual, or going quick up a hill, or even up stairs; with great difficulty of breathing, so as to occasion the patient instantly to stop. A pain in the arms about the insertion of the tendon of the pectoral muscle generally attends, and a desire of resting by hanging on a door or branch of a tree by the arms is sometimes observed. Which is explained in Class I. 2. 3. 14. and in Sect. XXIX. 5. 2.

These patients generally die suddenly; and on examining the thorax no certain cause, or seat, of the

the diſeaſe has been detected; ſome have ſuppoſed the valves of the arteries, or of the heart, were imperfect; and others that the accumulation of fat about this viſcus or the lungs obſtructed their due action; but other obſervations do not accord with theſe ſuppoſitions.

Mr. W——, an elderly gentleman, was ſeized with aſthma during the hot part of laſt ſummer; he always waked from his firſt ſleep with difficult reſpiration, and pain in the middle of his ſternum, and after about an hour was enabled to ſleep again. As this had returned for about a fortnight, it appeared to me to be an aſthma complicated with the diſeaſe, which Dr. Heberden has called angina pectoris. It was treated by veneſection, a cathartic, and then by a grain of opium given at going to bed, with ether and tincture of opium when the pain or aſthma recurred, and laſtly with the bark, but was ſeveral days before it was perfectly ſubdued.

Th s led me to conceive, that in this painful aſthma the diaphragm, as well as the other muſcles of reſpiration, was thrown into convulſive action, and that the fibres of this muſcle not having proper antagoniſts, a painful fixed ſpaſm of it, like that of the muſcles in the calf of the leg in the cramp, might be the cauſe of death in the angina pectoris, which I have thence arranged under the name of painful aſthma, and leave for further inveſtigation.

From the hiſtory of the caſe of the late much lamented

lamented John Hunter, and from the appearances after death, the case seems to have been of this kind, complicated with vertigo and consequent affection of the stomach. The remote cause seems to have arisen from ossifications of the coronary arteries; and the immediate cause of his death from fixed spasm of the heart. Other histories and dissections are still required to put this matter out of doubt; as it is possible, that either a fixed spasm of the diaphragm, or of the heart, which are both furnished with but weak antagonists, may occasion sudden death; and these may constitute two distinct diseases.

Four patients I have now in my recollection, all of whom I believed to labour under the angina pectoris in a great degree; which have all recovered, and have continued well three or four years by the use, as I believe, of issues on the inside of each thigh; which were at first large enough to contain two pease each, and afterwards but one. They took besides some slight antimonial medicine for a while, and were reduced to half the quantity or strength of their usual potation of fermented liquor.

The use of femoral issues in angina pectoris was first recommended by Dr. Macbride, physician at Dublin, Med. Observ. and Enquir. Vol. VI. And I was further induced to make trial of them, not only because the means which I had before used were inadequate, but from the ill

effect

effect I once obſerved upon the lungs, which ſucceeded the cure of a ſmall ſore beneath the knee; and argued converſely, that iſſues in the lower limbs might aſſiſt a difficult reſpiration.

Mrs. L——, about fifty, had a ſmall ſore place, about the ſize of half a pea on the inſide of the leg a little below the knee. It had diſcharged a pellucid fluid, which ſhe called a ley-water, daily for fourteen years, with a great deal of pain; on which account ſhe applied to a ſurgeon, who, by means of bandage and a ſaturnine application, ſoon healed the ſore, unheedful of the conſequences. In leſs than two months after this I ſaw her with great difficulty of breathing, which with univerſal anaſarca ſoon deſtroyed her.

The theory of the double effect of iſſues, as above related, one in relieving by their preſence the aſthma dolorificum, and the other in producing by its cure an anaſarca of the lungs, is not eaſy to explain. Some ſimilar effects from cutaneous eruptions and from bliſters are mentioned in Claſs I. 1. 2. 9. In theſe caſes it ſeems probable, that the pain occaſioned by iſſues, and perhaps the abſorption of a ſmall quantity of aerated purulent matter, ſtimulate the whole ſyſtem into greater energy of action, and thus prevent the torpor which is the beginning of ſo many diſeaſes. In confirmation of this effect of pain on the ſyſtem, I remember the caſe of a lady of an ingenious and active mind, who, for many of the latter years of her life, was perpetually

tually ſubject to great pains of her head from decaying teeth. When all her teeth were gone, ſhe became quite low ſpirited, and melancholy in the popular ſenſe of that word, and after a year or two became univerſally dropſical and died.

M. M. Iſſues in the thighs. Five grains of rhubarb, and one ſixth of a grain of emetic tartar every night for ſome months, with or without half a grain of opium. No ſtronger liquor than ſmall beer, or wine diluted with twice its quantity of water. Since I wrote the above I have ſeen two caſes of hydrops thoracis, attended with pain in the left arm, ſo as to be miſtaken for aſthma dolorificum, in which femoral iſſues, though applied early in the diſeaſe, had no effect.

12. *Stridor dentium.* The clattering of the teeth on going into cold water, or in the beginning of ague-fits, is an exertion along with the tremblings of the ſkin to relieve the pain of cold. The teeth and ſkin being more ſenſible to cold than the more internal parts, and more expoſed to it, is the reaſon that the muſcles, which ſerve them, are thrown into exertion from the pain of cold rather than thoſe of reſpiration, as in ſcreaming from more acute pain. Thus the poet,

> Put but your toes into cold water,
> Your correſpondent teeth will clatter.
>
> PRIOR.

In

In more acute pains the jaws are gnaſhed together with great vehemence, inſomuch that ſometimes the teeth are ſaid to have been broken by the force. See Sect. XXXIV. 1. 3. In theſe caſes ſomething ſhould be offered to the patient to bite, as a towel, otherwiſe they are liable to tear their own arms, or to bite their attendants, as I have witneſſed in the painful epilepſy.

13. *Tetanus triſmus.* Cramp. The tetanus conſiſts of a fixed ſpaſm of almoſt all the muſcles of the body; but the triſmus, or locked jaw, is the moſt frequent diſeaſe of this kind. It is generally believed to ariſe from ſympathy with an injured tendon. In one caſe where it occurred in conſequence of a broken ankle from a fall from a horſe, it was preceded by evident hydrophobia. Amputation was adviſed, but not ſubmitted to; two wounds were laid into one with ſciſſors, but the patient died about the ſeventh day from the accident. In this caſe the wounded tendon, like the wounds from the bite of a mad dog, did not produce the hydrophobia, and then the locked jaw, till ſeveral days after the accident.

I twice witneſſed the locked jaw from a pain beneath the ſternum, about the part where it is complained of in painful aſthma, or angina pectoris, in the ſame lady at ſome years diſtance of time. The laſt time it had continued two days, and ſhe wrote her mind, or expreſſed herſelf by

ſigns;

ſigns. On obſerving a broken tooth, which made a ſmall aperture into her mouth, I rolled up five grains of opium like a worm about an inch long, and introducing it over the broken tooth, puſhed it onward by means of a ſmall crow-quill; as it diſſolved I obſerved ſhe ſwallowed her ſaliva, and in leſs than half an hour ſhe opened her mouth and converſed as uſual.

Men are taught to be aſhamed of ſcreaming from pain in their early years; hence they are prone to exert the muſcles of the jaws inſtead, which they have learnt to exert frequently and violently from their infancy; whence the locked jaw. This and the following ſpaſm have no alternative relaxations, like the preceding ones; which is perhaps owing, firſt, to the weakneſs of their antagoniſt muſcles, thoſe which elevate the jaw being very ſtrong for the purpoſe of biting and maſticating hard ſubſtances, and for ſupporting the under jaw, with very weak antagoniſt muſcles; and ſecondly, to their not giving ſufficient relief even for a moment to the pain, or its preceding irritation, which excited them.

M. M. Opium in very large quantities. Mercurial ointment uſed extenſively. Electricity. Cold bath. Dilate the wound, and fill it with lint moiſtened with ſpirit of turpentine; which inflames the wound, and cures or prevents the convulſions. See a caſe, Tranſact. of American Society, Vol. II. p. 227.

Wine

Wine in large quantities in one caſe was more ſucceſsful than opium; it probably inflames more, which in this diſeaſe is deſirable. Between two or three ounces of bark, and from a quart to three pints of wine a day, ſucceeded better than opium. Ib.

14. *Tetanus dolorificus.* Painful cramp. This kind of ſpaſm moſt frequently attacks the calf of the leg, or muſcles of the toes; it often precedes paroxyſms of gout, and appears towards the end of violent diarrhœa, and from indigeſtion, or from acid diet. In theſe caſes it ſeems to ſympathize with the bowels, but is alſo frequently produced by the pain of external cold, and by the too great previous extenſion of the muſcles, whence ſome people get the cramp in the extenſor muſcles of the toes after walking down hill, and of thoſe of the calf of the leg after walking up a ſteep eminence. For the reaſon why theſe cramps commence in ſleep, ſee Sect. XVIII. 15.

The muſcle in this diſeaſe contracts itſelf to relieve ſome ſmaller pain, either from irritation or aſſociation, and then falls into great pain itſelf, from the too great action of its own fibres. Hence any muſcle, by being too vehemently exerted, falls into cramp, as in ſwimming too forcibly in water, which is painfully cold; and a ſecondary pain is then induced by the too violent

violent contraction of the muſcle; though the pain, which was the cauſe of the contraction, ceaſes. Which accounts for the continuance of the contraction, and diſtinguiſhes this diſeaſe from other convulſions, which are relaxed and exerted alternately. Hence whatever may be the cauſe of the primary pain, which occaſions the cramp of the calf of the leg, the ſecondary one is relievable by ſtanding up, and thus by the weight of the body on the toes forcibly extending the contracted muſcles. For the cauſe, which induces theſe muſcles of the calf of the leg to fall into more violent contraction than other ſpaſmodic muſcles, proceeds from the weakneſs of their antagoniſt muſcles; as they are generally extended again after action by the weight of the body on the balls of the toes. See the preceding article.

M. M. Rub the legs with camphor diſſolved in oil, and let the patient wear ſtockings in bed. If a foot-board be put at the bed's feet, and the bed be ſo inclined, that he will reſt a little with his toes againſt the foot-board, that preſſure is ſaid to prevent the undue contractions of the muſculi gaſtrocnemii, which conſtitute the calf of the leg. In gouty patients, or where the bowels are affected with acidity, half a grain of opium, and ſix grains of rhubarb, and ſix of chalk, every night. Fleſh-meat for ſupper. A little very weak warm ſpirit and water may be

taken for prefent relief, when thefe cramps are very troublefome to weak or gouty patients.

15. *Hydrophobia.* Dread of water generally attending canine madnefs. I was witnefs to a cafe, where this difeafe preceded the locked jaw from a wound in the ankle, occafioned by a fall from a horfe; as mentioned in the preceding article. It came on about the fixth day after the accident; when the patient attempted to fwallow fluids, he became convulfed all over from the pain of this attempt, and fpurted them out of his mouth with violence. It is alfo faid to happen in fome hyfterical cafes. Hence it feems rather the immediate confequence of a pained tendon, than of a contagious poifon. And is fo far analogous to tetanus, according with the opinions of Dr. Rufh and Dr. Percival.

In other refpects, as it is produced by the faliva of an enraged animal inftilled into a wound, it would feem analogous to the poifon of venomous animals. And from the manner of its accefs fo long after the bite, and of its termination in a fhort time, it would feem to refemble the progrefs of contagious fevers. See Sect. XXII. 3. 3.

If the patient was bitten in a part, which could be totally cut away, as a finger, even after the hydrophobia appears, it is probable it might cure it; as I fufpect the caufe ftill remains

mains in the wounded tendon, and not in a diffused infection tainting the blood. Hence there are generally uneasy sensations, as cold or numbness, in the old cicatrix, before the hydrophobia commences. See a case in Medical Communications, Vol. II. p. 190.

If the diseased tendon could be inflamed without cutting it out, as by cupping, or caustic, or blister after cupping, and this in the old wound long since healed, after the hydrophobia commences, it might prevent the spasms about the throat. As inflaming the teeth by the use of mercury is of use in some kinds of hemicrania. Put spirit of turpentine on the wound, wash it well. See Class I. 3. 1. 11. IV. 1. 2. 7.

M. M. Wine, musk, oil, internally. Opium, mercurial ointment, used extensively. Mercurial fumigation. Turpeth mineral. To salivate the patient as soon as possible. Exsection or a caustic on the scar, even after the appearance of hydrophobia. Put a tight bandage on the limb above the scar of the old wound to benumb the pained tendon, however long the wound may have been healed. Could a hollow catheter of elastic gum, caoutchouc, be introduced into the œsophagus by the mouth or nostril, and liquid nourishment be thus conveyed into the stomach? See Desault's Journal, Case I. where in an ulcer of the mouth, such a catheter was introduced by the nostril, and kept in the œso-

 phagus

phagus for a month, by which means the patient was nourifhed and preferved.

It is recommended by Dr. Bardfley to give oil internally by a fimilar method contrived by Mr. John Hunter. He covered a probang with the fkin of a fmall eel, or the gut of a lamb or cat. It was tied up at one end above and below the fponge, and a flit made above the upper ligature; to the other end of the eel fkin or gut was fixed a bladder and pipe. The probang thus covered was introduced into the ftomach, and the liquid food or medicine was put into the bladder and fqueezed down through the eel-fkin. Mem. of Society at Manchefter. See Clafs I. 2. 3. 25.

Dr. Bardfley has endeavoured to prove, that dogs never experience the hydrophobia, or canine madnefs, without having been previoufly bitten or infected; and fecondly, that the difeafe in this fpecies of animal always fhews itfelf in five or fix weeks; and concludes from hence, that this dreadful malady might be annihilated by making all the dogs in Great Britain perform a kind of quarantine, by fhutting them up for a certain number of weeks. Though the difeafe from the bite of the mad dog is perhaps more analogous to thofe from the wounds inflicted by venomous animals than to thofe from other contagious matter, yet thefe obfervations are well worthy further attention; which the author promifes.

In

In Dr. Hamilton's elaborate treatiſe on hydrophobia, Longman, London, it is propoſed to try the effect of arſenic in this diſeaſe, which is ſaid to be the principal ingredient of the Tanjore pill, which is ſaid to cure thoſe who are diſeaſed by the bite of ſerpents, and to cure the hydrophobia.

A ſolution of ſublimate of mercury in rectified ſpirits is alſo worthy a trial, as mentioned in Claſs I. 3. 1. 11.

ORDO I.

Increaſed Volition.

GENUS II.

With increaſed Actions of the Organs of Senſe.

IN every ſpecies of madneſs there is a peculiar idea either of deſire or averſion, which is perpetually excited in the mind with all its connections. In ſome conſtitutions this is connected with pleaſurable ideas without the exertion of much muſcular action, in others it produces violent muſcular action to gain or avoid the object of it, in others it is attended with deſpair and inaction. Mania is the general word for the two former of theſe, and melancholia for the latter; but the ſpecies of them are as numerous as the deſires and averſions of mankind.

In the preſent age the pleaſurable inſanities are moſt frequently induced by ſuperſtitious hopes of Heaven, by ſentimental love, and by perſonal vanity. The furious inſanities by pride, anger, revenge, ſuſpicion. And the melancholy ones by fear of poverty, fear of death, and fear of Hell; with innumerable others.

Quicquid agunt homines, votum, timor, ira, voluptas,
Gaudia, diſcurſus, noſtri eſt farrago libelli.

JUVEN. I. 85.

This

This idea, however, which induces madneſs or melancholy, is generally untrue; that is, the object is a miſtaken fact. As when a patient is perſuaded he has the itch, or venereal diſeaſe, of which he has no ſymptom, and becomes mad from the pain this idea occaſions. So that the object of madneſs is generally a delirious idea, and thence cannot be conquered by reaſon; becauſe it continues to be excited by painful ſenſation, which is a ſtronger ſtimulus than volition. Moſt frequently pain of body is the cauſe of convulſion, which is often however exchanged for madneſs; and a painful delirious idea is moſt frequently the cauſe of madneſs originally, but ſometimes of convulſion. Thus I have ſeen a young lady become convulſed from a fright, and die in a few days; and a temporary madneſs frequently terminates the paroxyſms of the epilepſia dolorifica, and an inſanity of greater permanence is frequently induced by the pains or bruiſes of parturition.

Where the patient is debilitated a quick pulſe ſometimes attends inſane people, which is nevertheleſs generally only a ſymptom of the debility owing to the too great expenditure of ſenſorial power; or of the paucity of its production, as in irritative, or in ſenſitive inirritated fever. See Claſs III. 1. 1.

But nevertheleſs where the quick pulſe is permanent, it ſhews the preſence of fever; and as the madneſs then generally ariſes from the diſagree-

able ſenſations attending the fever, it is ſo far a good ſymptom; becauſe when the fever is eured, or ceaſes ſpontaneouſly, the inſanity moſt frequently vaniſhes at the ſame time.

The ſtimulus of ſo mueh volition ſupports inſanc people under variety of hardſhips, and eontributes to the cure of diſeaſes from debility, as ſometimes occurs towards the end of fevers. See Sect. XXXIV. 2. 5. And, on the ſame account, they bear large doſes of medieines to proeure any operation on them; as emetics, and eathartics, which, before they produce their effect in inverting the motions of the ſtomach in vomiting, or of the abſorbents of the bowels in purging, muſt firſt weaken the natural actions of thoſe organs, as ſhewn in Sect. XXXV. 1. 13.

From theſe conſiderations it appears, that the indications of cure muſt eonſiſt in removing the cauſe of the pain, whether it ariſes from a delirious idea, or from a real fact, or from bodily diſeaſe; or ſeeondly, if this cannot be done, by relieving the pain in conſequence of ſueh idea or diſeaſe. The firſt is ſometimes effected by preſenting frequently in a day contrary ideas to ſhew the fallaey, or the too great eſtimation, of the painful ideas. 2dly. By ehange of plaee, and thus preſenting the ſtimulus of new objects, as a long journey. 3dly. By producing forgetfulneſs of the idea or object, whieh cauſes their pain; by removing all things which recal it to their minds;

minds; and avoiding all converſation on ſimilar ſubjects. For I ſuppoſe no diſeaſe of the mind is ſo perfectly cured by other means as by forgetfulneſs.

Secondly, the pain in conſequence of the ideas or bodily diſeaſes above deſcribed is to be removed, firſt, by evacuations, as veneſection, emetics, and cathartics; and then by large doſes of opium, or by the vertigo occaſioned by a circulating ſwing, or by a ſea-voyage, which, as they affect the organs of ſenſe as well as evacuate the ſtomach, may contribute to anſwer both indications of cure.

Where maniacs are outrageous, there can be no doubt but coercion is neceſſary; which may bed one by means of a ſtrait waiſtcoat; which diſarms them without hurting them; and by tying a handkerchief round their ankles to prevent their eſcape. In others there can be no doubt, but that confinement retards rather than promotes their cure; which is forwarded by change of ideas in conſequence of change of place and of objects, as by travelling or ſailing.

The circumſtances which render confinement neceſſary, are firſt, if the lunatic is liable to injure others, which muſt be judged of by the outrage he has already committed. 2dly. If he is likely to injure himſelf; this alſo muſt be judged of by the deſpondency of his mind, if ſuch exiſts. 3dly. If he cannot take care of his affairs.

fairs. Where none of these circumstances exist, there should be no confinement. For though the mistaken idea continues to exist, yet if no actions are produced in consequence of it, the patient cannot be called insane. He can only be termed delirious. If every one, who possesses mistaken ideas, or who puts false estimates on things, was liable to confinement, I know not who of my readers might not tremble at the sight of a madhouse!

The most convenient distribution of insanities will be into general, as mania mutabilis, studium inane, and vigilia; and into partial insanities. These last again may be subdivided into desires and aversions, many of which are succeeded by pleasurable or painful ideas, by fury or dejection, according to the degree or violence of their exertions. Hence the analogy between the insanities of the mind, and the convulsions of the muscles described in the preceding genus, is curiously exact. The convulsions without stupor, are either just sufficient to obliterate the pain, which occasions them; or are succeeded by greater pain, as in the convulsio dolorifica. So the exertions in the mania mutabilis are either just sufficient to allay the pain which occasions them, and the patient dwells comparatively in a quiet state; or those exertions excite painful ideas, which are succeeded by furious discourses, or outrageous actions. The studium inane, or reverie,

reverie, resembles epilepsy, in which there is no sensibility to the stimuli of external objects. Vigilia, or watchfulness, may be compared to the general writhing of the body; which is just a sufficient exertion to relieve the pain which occasions it. Erotomania may be compared to trismus, or other muscular fixed spasm, without much subsequent pain; and mœror to cramp of the muscles of the leg, or other fixed spasm with subsequent pain. All these coincidences contribute to shew, as explained in Sect. III. 5, that our ideas are motions of the immediate organs of sense obeying the same laws as our muscular motions.

The violence of action accompanying insanity depends much on the education of the person; those who have been proudly educated with unrestrained passions, are liable to greater fury; and those, whose education has been humble, to greater despondency. Where the delirious idea, above described, produces pleasurable sensations, as in personal vanity or religious enthusiasm; it is almost a pity to snatch them from their fool's paradise, and reduce them again to the common lot of humanity; lest they should complain of their cure, like the patient described in Horace,

———Pol! me occidistis, amici,
Non servastis, ait, cui sic extorta voluptas,
Et demptus per vim mentis gratissimus error!

As

As infanities arife from excefs of action of the fenforial power of volition, this excefs of action may be owing either to the increafe of motive or ftimulus, or to an increafed quantity or accumulation of that fenforial power. And hence, though the greateft number of infanities originate from increafed motive to voluntary action, as to avoid pain or to acquire pleafure; yet there appear to be fome, which have for their caufe an accumulation of the fenforial power of volition.

Thus thofe, who have been accuftomed to perpetual exertions of volition in carrying on fome extenfive employment or profeffion during the firft half of their lives, are liable to become melancholy, and even to deftroy themfelves, if they fuddenly leave off their very active and anxious exertions, and retire to a fituation without employment, of which many inftances have occurred. This feems to originate from the pain occafioned by the accumulation of the fenforial power of volition, which now ceafes to be expended for want of motive. The tædium vitæ defcribed in No. X of this genus of difeafes affects indolent people, who poffefs accumulated fenforial power, but want motive to excite it into fuch actions of the mufcles or ideas, as might in part expend it.

The accumulation of fenforial power from the defect of accuftomed actions feems to give rife to fome inordinate mufcular motions, as the inceffant

ſant jumping of a ſquirrel confined in a cage, and ſome of the motions of children confined too long in ſchools, which are called tricks. See Claſs III. 1. 1. 1. and IV. 1. 3. 2. And I am inclined to think, that theſe inſanities, which are termed melancholy, where no previous misfortune has occurred, as in grief or diſappointed love, but where the patient ſits perpetually brooding over ſome painful idea, which was not previouſly excited by any external event, as in the tædium vitæ, are in general occaſioned by accumulations of ſenſorial power; and the violent inſanities to increaſe of motive; that is, to thoſe pains or want of pleaſure, which excite averſion or deſire.

There is finally reaſon to believe, that not only ſenſorial power in general is capable of accumulation in thoſe parts which have been accuſtomed to almoſt perpetual action; but alſo that each kind or ſpecies of ſenſorial power, as that of irritation, ſenſation, volition, and aſſociation, is ſeparately capable of accumulation in the parts, which have almoſt perpetually been actuated by it: which I hope ſometime to conſider more at large, as I ſuſpect it may ſupply a key to many of the phænomena not only of inſanities and convulſions, but to thoſe of fever.

The diſpoſition to inſanity, as well as to convulſion, is believed to be hereditary; and in conſequence to be induced in thoſe families from

ſlighter cauſes than in others. Convulſions have been ſhewn to have been moſt frequently induced by pains owing to defect of ſtimulus, as the ſhuddering from cold, and not from pains from exceſs of ſtimulus, which are generally ſucceeded by inflammation. But inſanities are on the contrary generally induced by pains from exceſs of ſtimulus, as from the too violent actions of our ideas, as in common anger, which is an inſanity of ſhort duration; for inſanities generally, though not always, ariſe from pains of the organs of ſenſe; but convulſions generally, though not always, from pains of the membranes or glands. And it has been previouſly explained, that though the membranes and glands, as the ſtomach and ſkin, receive great pain from want of ſtimulus; yet that the organs of ſenſe, as the eye and ear, receive no pain from defect of ſtimulus.

Hence it follows, that the conſtitutions moſt liable to convulſion, are thoſe which moſt readily become torpid in ſome part of the ſyſtem, that is, which poſſeſs leſs irritability; and that thoſe moſt liable to inſanity, are ſuch as have exceſs of ſenſibility; and laſtly, that theſe two circumſtances generally exiſt in the ſame conſtitution; as explained in Sect. XXXI. 2. on Temperaments. Theſe obſervations explain why epilepſy and inſanity frequently ſucceed or reciprocate with each other, and why inirritable habits, as

ſcrofulous

ſcrofulous ones, are liable to inſanity, of which I have known ſome inſtances.

In many caſes however there is no appearance of the diſpoſition to epilepſy or inſanity of the parent being tranſmitted to the progeny. Firſt, where the inſanity has ariſen from ſome violent diſappointment, and not from intemperance in the uſe of ſpirituous liquors. Secondly, where the parent has acquired the inſanity or epilepſy by habits of intoxication after the procreation of his children. Which habits I ſuppoſe to be the general cauſe of the diſpoſition to inſanity in this country. See Claſs III. 1. 1. 7.

As the diſpoſition to gout, dropſy, epilepſy, and inſanity, appears to be produced by the intemperate uſe of ſpirituous potation, and is in all of them hereditary; it ſeems probable, that this diſpoſition gradually increaſes from generation to generation, in thoſe families which continue for many generations to be intemperate in this reſpect; till at length theſe diſeaſes are produced; that is, the irritability of the ſyſtem gradually is decreaſed by this powerful ſtimulus, and the ſenſibility at the ſame time increaſed, as explained in Sect. XXXI. 1. and 2. This diſpoſition is communicated to the progeny, and becomes ſtill increaſed, if the ſame ſtimulus be continued, and ſo on by a third and fourth generation; which accounts for the appearance of epilepſy in the children of ſome families, where it

it was never known before to have exiſted, and could not be aſcribed to their own intemperance. A parity of reaſoning ſhews, that a few ſober generations may gradually in the ſame manner reſtore a due degree of irritability to the family, and decreaſe the exceſs of ſenſibility.

From hence it would appear probable, that ſcrofula and dropſy are diſeaſes from inirritability; but that in epilepſy and inſanity an exceſs of ſenſibility is added, and the two faulty temperaments are thus conjoined.

SPECIES.

1. *Mania mutabilis.* Mutable madneſs. Where the patients are liable to miſtake ideas of ſenſation for thoſe from irritation, that is, imaginations for realities, if cured of one ſource of inſanity, they are liable in a few months to find another ſource in ſome new miſtaken or imaginary idea, and to act from this new idea. The idea belongs to delirium, when it is an imaginary or miſtaken one; but it is the voluntary actions exerted in conſequence of this miſtaken idea, which conſtitute inſanity.

In this diſeaſe the patient is liable carefully to conceal the object of his deſire or averſion. But a conſtant inordinate ſuſpicion of all people, and a careleſſneſs of cleanlineſs, and of decency, are generally concomitants of madneſs. Their deſigns cannot

cannot be counteracted, till you can investigate the delirious idea or object of their insanity; but as they are generally timid, they are therefore less to be dreaded.

Z. Z. called a young girl, one of his maid-servants, into the parlour, and, with cocked pistols in his hands, ordered her to strip herself naked; he then inspected her with some attention, and dismissed her untouched. Then he stripped two of his male servants in the same manner, to the great terror of the neighbourhood. After he was secured, with much difficulty he was persuaded to tell me, that he had got the itch, and had examined some of his servants to find out from whom he had received it; though at the same time there was not a spot to be seen on his hands, or other parts. The outrages in consequence of this false idea were in some measure to be ascribed to the pride occasioned by unrestrained education, affluent wealth, and dignified family.

Madness is sometimes produced by bodily pain, particularly I believe of a diseased liver, like convulsion and epilepsy; at other times it is caused by very painful ideas occasioned by external circumstances, as of grief or disappointment; but the most frequent cause of insanity arises from the pain of some imaginary or mistaken idea; which may be termed hallucinatio maniacalis. This hallucination of one of the

ſenſes is often produced in an inſtant, and generally becomes gradually weakened in proceſs of time, by the perpetual ſtimulus of external objects, or by the ſucceſſions of other catenations of ideas, or by the operations of medicines; and when the maniacal hallucination ceaſes, or is forgotten, the violent exertions ceaſe, which were in conſequence of it, and the diſeaſe is cured.

Mr. ———, a clergyman, about forty years of age, who was rather a weak man, happened to be drinking wine in jocular company, and by accident ſwallowed part of the ſeal of a letter, which he had juſt then received; one of his companions ſeeing him alarmed, cried out in humour, "It will ſeal your bowels up." He became melancholy from that inſtant, and in a day or two refuſed to ſwallow any kind of nouriſhment. On being preſſed to give a reaſon for this refuſal, he anſwered he knew nothing would paſs through him. A cathartic was given, which produced a great many evacuations, but he ſtill perſiſted, that nothing paſſed through him; and though he was frightened into taking a little broth once or twice by threats, yet he ſoon ceaſed intirely to ſwallow any thing, and died in conſequence of this inſane idea.

Miſs ——, a ſenſible and ingenious lady, about thirty, ſaid ſhe had ſeen an angel; who told her, that ſhe need not eat, though all others were under the neceſſity of ſupporting their

earthly existence by food. After fruitless persuasions to take food, she starved herself to death. —It was proposed to send an angel of a higher order to tell her, that now she must begin to eat and drink again; but it was not put into execution.

Mrs. ———, a lady between forty and fifty years of age, imagined that she heard a voice say to her one day, as she was at her toilet, "Repent, or you will be damned." From that moment she became melancholy, and this hallucination affected her in greater or less degree for about two years; she then recovered perfectly, and is now a cheerful old woman.

Mrs. ———, a farmer's wife, going up stairs to dress, found the curtains of her bed drawn, and on undrawing them, she believed that she saw the corpse of her sister, who was then ill at the distance of twenty miles, and became from that time insane; and as her sister died about that time, she could not be produced to counteract the insane hallucination, but she perfectly recovered in a few months.

Mrs. ———, a most elegant, beautiful, and accomplished lady, about twenty-two years of age, had been married about two months to an elegant, polished, and affluent young man, and it was well known to be a love-match on both sides. She suddenly became melancholy, and yet not to so great a degree, but that she could com-

mand herſelf to do the honours of her table with grace and apparent caſe. After many days intreaty, ſhe at length told me, that ſhe thought her marrying her huſband had made him unhappy; and that this idea ſhe could not efface from her mind day or night. I withſtood her being confined, as ſome had adviſed, and propoſed a ſea-voyage to her, with expectation that the ſickneſs as well as change of objects, might remove the inſane hallucination, by introducing other energetic ideas; this was not complied with, but ſhe travelled about England with her friends and her huſband for many months, and at length perfectly recovered, and is now I am informed in health and ſpirits.

Theſe caſes are related to ſhew the utility of endeavouring to inveſtigate the maniacal idea, or hallucination; as it may not only acquaint us with the probable deſigns of the patient, from whence may be deduced the neceſſity of confinement; but alſo may ſome time lead to the moſt effectual plan of cure.

I received good information of the truth of the following caſe, which was publiſhed a few years ago in the newſpapers. A young farmer in Warwickſhire, finding his hedges broke, and the ſticks carried away during a froſty ſeaſon, determined to watch for the thief. He lay many cold hours under a hay-ſtack, and at length an old woman, like a witch in a play, approached,

approached, and began to pull up the hedge; he waited till she had tied up her bottle of sticks, and was carrying them off, that he might convict her of the theft, and then springing from his concealment, he seized his prey with violent threats. After some altercation, in which her load was left upon the ground, she kneeled upon her bottle of sticks, and raising her arms to Heaven beneath the bright moon then at the full, spoke to the farmer already shivering with cold, "Heaven grant, that thou never mayest know again the blessing to be warm." He complained of cold all the next day, and wore an upper coat, and in a few days another, and in a fortnight took to his bed, always saying nothing made him warm, he covered himself with very many blankets, and had a sieve over his face, as he lay; and from this one insane idea he kept his bed above twenty years for fear of the cold air, till at length he died.

M. M. As mania arises from pain either of our muscles or organs of sense, the arts of relieving pain must constitute the method of cure. See Sect. XXXIV. 3. 4. Venesection. Vomits of from five grains to ten of emetic tartar, repeated every third morning for three or four times; with solution of gum ammoniae, and soluble tartar, so as to purge gently every day. Afterwards warm bath for two or three hours a day. Opium in large doses. Bark. Steel.

Dr. Binns gave two ſcruples (40 grains) of ſolid opium at a doſe, and twenty grains four hours afterwards; which reſtored the patient. Dr. Brandreth gave 400 drops of laudanum to a maniac in the greateſt poſſible furor, and in a few hours he became calm and rational. Med. Comment. for 1791, p. 384.

Prognoſtic.

THE temporary quick pulſe attending ſome maniacal caſes is ſimply a ſymptom of debility, and is the conſequence of too great exertions; but a permanent quick pulſe ſhews the preſence of fever, and is frequently a ſalutary ſign; becauſe, if the life of the patient be ſafe, when the fever ceaſes, the inſanity generally vaniſhes along with it, as mentioned above. In this caſe the kind of fever muſt direct the method of curing the inſanity; which muſt conſiſt of moderate evacuations and diluents, if the pulſe be ſtrong; or of nutrientia, bark, and ſmall doſes of opium, if the pulſe be weak.

Where the cauſe is of a temporary nature, as in puerperal inſanity, there is reaſon to hope, that the diſeaſe will ceaſe, when the bruiſes, or other painful ſenſations attending this ſtate, are removed. In theſe caſes the child ſhould be brought frequently to the mother, and applied to her breaſt, if ſhe will ſuffer it, and this whether

ther ſhe at firſt attends to it or not; as by a few trials it frequently excites the ſtorgè, or maternal affection, and removes the inſanity, as I have witneſſed.

When the madneſs is occaſioned by pain of the teeth, which I believe is no uncommon caſe, theſe muſt be extracted; and the cure follows the extinction of the pain. There is however ſome difficulty in detecting the delinquent tooth in this caſe, as in hemicrania, unleſs by its apparent decay, or by ſome previous information of its pain having been complained of; becauſe the pain of the tooth ceaſes, as ſoon as the exertions of inſanity commence. In this caſe ſalivation might be tried.

When a perſon becomes inſane, who has a family of ſmall children to ſolicit his attention, the prognoſtic is very unfavourable; as it ſhews the maniacal hallucination to be more powerful than thoſe ideas which generally intereſt us the moſt.

When an inſane young man ſhews no laſcivious idea, when an opportunity of gratifying the paſſion of love is preſented to him, as in the caſe above mentioned of Z. Z. or when an inſane young lady ſhews no ſymptom of attachment, when addreſſed honourably by a proper lover, the prognoſtic is unfavourable, as it ſhews the maniacal hallucination to affect the mind ſtronger than the natural paſſion of love, which in civilized ſociety is ſtrengthened by reſtraint.

Paralytic affections are ſaid by Mr. Haſlam, to be frequently ſucceeded by inſanity, and that in theſe caſes the inactivity of ſome paralytic muſcles about the face or limbs with defective memory continue along with the inſanity; and he adds that theſe patients are ſeldom relieved. Obſervations on Inſanity by J. Haſlam, 8vo. Rivington. It was before obſerved, that when ſome limbs become paralytic, as in the common hemiplegia, that the other limbs are liable to be for ſome time in almoſt perpetual action, owing to the ſuperfluity of volition, which was previouſly expended by the action of thoſe muſcles, which are now rendered diſobedient to the ſenſorial power of volition, though they may continue to be excitable by irritation or ſenſation, as in the act of pandiculation, or by electric ſhocks. Now if this ſuperfluity of voluntary activity be exerted on the organs of ſenſe, delirious hallucinations and inſane actions are the conſequence; and as the power of life is already injured in a part of the ſyſtem, they are leſs liable to recover; and die like other paralytic patients. And thus the inſanities in conſequence of paralytic affections, as well as thoſe in conſequence of painful ſenſations or ideas, countenance the theory, that they ariſe from the exceſſive activity of the ſenſorial power of volition.

2. *Studium inane.* Reverie conſiſts of violent voluntary exertions of ideas to relieve pain, with

all

all the trains or tribes connected with them by ſenſations or aſſociations. It frequently alternates with epileptic convulſions; with which it correſponds, in reſpect to the inſenſibility of the mind to the ſtimuli of external objects, in the ſame manner as madneſs correſponds with common convulſion, in the patient's poſſeſſing at the ſame time a ſenſibility of the ſtimuli of external objects.

Some have been reported to have been involved in reverie ſo perfectly, as not to have been diſturbed by the diſcharge of a cannon; and others to have been inſenſible to torture, as the martyrs for religious opinions; but theſe ſeem more properly to belong to particular inſanities than to reverie, like noſtalgia and erotomania.

Reverie is diſtinguiſhed from madneſs as deſcribed above; and from delirium, becauſe the trains of ideas are kept conſiſtent by the power of volition, as the perſon reaſons and deliberates in it. Somnambuliſmus is a part of reverie, ſomnambuliſm conſiſting in the exertions of the locomotive muſcles, and reverie in the exertions of the organs of ſenſe; See Claſs I. 1. 1. 9. and Sect. XIX. both which are mixed, or alternate with each other, for the purpoſe of relieving pain.

When the patients in reverie exert their volition on their organs of ſenſe, they can occaſionally perceive the ſtimuli of external objects, as explained in Sect. XIX. And in this caſe it reſembles ſometimes an hallucination of the ſenſes,

as

as there is a mixture of fact and imagination in their discourse; but may be thus distinguished: hallucinations of the senses are allied to delirium, and are attended generally with quick pulse, and other symptoms of great debility; but reverie is without fever, and generally alternates with convulsions; and so much intuitive analogy (see Sect. XVII. 3. 7.) is retained in its paroxysms, as to preserve a consistency in the trains of ideas.

Miss G——, whose case is related in Sect. III. 5. 8. said, as I once sat by her, "My head is fallen off, see it is rolled to that corner of the room, and the little black dog is nibbling the nose off." On my walking to the place which she looked at, and returning, and assuring her that her nose was unhurt, she became pacified, though I was doubtful whether she attended to me. See Class III. 1. 1. 9. and Class III. 1. 2. 2.

M. M. Large doses of opium given before the expected paroxysm, as in epilepsia dolorifica, Class III. 1. 1. 8.

The hallucinatio studiosa, or false ideas in reverie, differ from maniacal hallucinations above described, as no insane exertions succeed, and in the patients whom I have seen they have always been totally forgotten, when the paroxysm was over.

Master ——, a school-boy about twelve years old, after he came out of a convulsion fit and

sat

ſat up in bed, ſaid to me, "Don't you ſee my father ſtanding at the feet of the bed, he is come a long way on foot to ſee me." I anſwered, no: "What colour is his coat?" He replied, "A drab colour." "And what buttons?" "Metal ones," he anſwered, and added, "how ſadly his legs are ſwelled." In a few minutes he ſaid, with apparent ſurpriſe, "He is gone," and returned to his perfect mind. Other caſes are related in Sect. XIX. and XXXIV. 3. and in Claſs III. 1. 2. 2. with further obſervations on this kind of hallucination; which however is not the cauſe of reverie, but conſtitutes a part of it, the cauſe being generally ſome uneaſy ſenſation of the body.

3. *Vigilia.* Watchfulneſs conſiſts in the unceaſing exertion of volition; which is generally cauſed by ſome degree of pain either of mind or of body, or from defect of the uſual quantity of pleaſurable ſenſation; hence if thoſe, who are accuſtomed to wine at night, take tea inſtead, they cannot ſleep. The ſame happens from want of ſolid food for ſupper, to thoſe who are accuſtomed to uſe it; as in theſe caſes there is pain or defect of pleaſure in the ſtomach.

Sometimes the anxiety about ſleeping, that is the deſire to ſleep, prevents ſleep; which conſiſts in an abolition of deſire or will. This may ſo far be compared to the impediment of ſpeech

deſcribed

deſcribed in Sect. XVII. 1. 10. as the interference of the will prevents the effect deſired.

Another ſource of watchfulneſs may be from the too great ſecretion of ſenſorial power in the brain, as in phrenzy, and as ſometimes happens from the exhibition of opium, and of wine; if the exhauſtion of ſenſorial power by the general actions of the ſyſtem occaſioned by the ſtimulus of theſe drugs can be ſuppoſed to be leſs than the increaſed ſecretion of it.

M. M. 1. Solid food to ſupper. Wine. Opium. Warm bath. 2. The patient ſhould be told that his want of ſleep is of no conſequence to his health. 3. Veneſection by cupping. Abſtinence from wine. 4. A bliſter by ſtimulating the ſkin, and rhubarb by ſtimulating the bowels, will ſometimes induce ſleep. Exerciſe. An uniform ſound, as of a pauſing drop of water, or the murmur of bees. Other means are deſcribed in Sect. XVIII. 20.

4. *Erotomania.* Sentimental love. Deſcribed in its exceſs by romance writers and poets. As the object of love is beauty, and as our perception of beauty conſiſts in a recognition by the ſenſe of viſion of thoſe objects, which have before inſpired our love, by the pleaſure they have afforded to many of our ſenſes (Sect. XVI. 6.); and as brute animals have leſs accuracy of their ſenſe of viſion than mankind (ib.); we ſee the

reaſon

reaſon why this kind of love is not frequently obſervable in the brute creation, except perhaps in ſome married birds, or in the affection of the mother to her offſpring. Men, who have not had leiſure to cultivate their taſte for viſible objects, and who have not read the works of poets and romance-writers, are leſs liable to ſentimental love; and as ladies are educated rather with an idea of being choſen, than of chooſing; there are many men, and more women, who have not much of this inſanity; and are therefore more eaſily induced to marry for convenience or intereſt, or from the flattery of one ſex to the other.

In its fortunate gratification ſentimental love is ſuppoſed to ſupply the pureſt ſource of human felicity; and from the ſuddenneſs with which many of thoſe patients, deſcribed in ſpecies I. of this genus, were ſeized with the maniacal hallucination, there is reaſon to believe, that the moſt violent ſentimental love may be acquired in a moment of time, as repreſented by Shakſpeare in the beginning of his Romeo and Juliet, as originally written.

Some have endeavoured to make a diſtinction between beauty and grace, and have made them as it were rivals for the poſſeſſion of the human heart; but grace may be defined beauty in action; for a ſleeping beauty cannot be called graceful in whatever attitude ſhe may recline;

the

the muſcles muſt be in action to produce a graceful attitude, and the limbs to produce a graceful motion. But though the object of love is beauty, yet the idea is nevertheleſs much enhanced by the imagination of the lover; which appears from this curious circumſtance, that the lady of his paſſion ſeldom appears ſo beautiful to the lover after a few months ſeparation, as his ideas had painted her in his abſence; and there is, on that account, always a little diſappointment felt for a minute at their next interview from this hallucination of his ideas.

This paſſion of love produces reverie in its firſt ſtate, which exertion alleviates the pain of it, and by the aſſiſtance of hope converts it into pleaſure. Then the lover ſeeks ſolitude, leſt this agreeable reverie ſhould be interrupted by external ſtimuli, as deſcribed by Virgil.

> Tantum inter denſas, umbroſa cacumina, fagos
> Aſſidue veniebat, ibi hæc incondita ſolus
> Montibus et ſylvis ſtudio jactabat inani.

When the pain of love is ſo great, as not to be relieved by the exertions of reverie, as above deſcribed; as when it is miſplaced on an object, of which the lover cannot poſſeſs himſelf; it may ſtill be counteracted or conquered by the ſtoic philoſophy, which ſtrips all things of their ornaments, and inculcates "nil admirari." Of which leſſons may be found in the meditations

of

of Marcus Antoninus. The maniacal idea is ſaid in ſome lovers to have been weakened by the action of other very energetic ideas; ſuch as have been occaſioned by the death of his favourite child, or by the burning of his houſe, or by his being ſhipwrecked. In thoſe caſes the violence of the new idea for a while expends ſo much ſenſorial power as to prevent the exertion of the maniacal one; and new catenations ſucceed. On this theory the lover's leap, ſo celebrated by poets, might effect a cure, if the patient eſcaped with life.

The third ſtage of this diſeaſe I ſuppoſe is irremediable; when a lover has previouſly been much encouraged, and at length meets with neglect or diſdain; the maniacal idea is ſo painful as not to be for a moment relievable by the exertions of reverie, but is inſtantly followed by furious or melancholy inſanity; and ſuicide, or revenge, have frequently been the conſequence. As was lately exemplified in Mr. Hackman, who ſhot Miſs Ray in the lobby of the playhouſe. So the poet deſcribes the paſſion of Dido,

——————Moriamur inultæ?—
At moriamur, ait,—ſic, ſic, juvat ire ſub umbras!

The ſtory of Medæa ſeems to have been contrived by Ovid, who was a good judge of the ſubject, to repreſent the ſavage madneſs occaſioned by ill-requited love. Thus the poet,

Earth

Earth has no rage like love to hatred turn'd,
Nor Hell a fury like a woman ſcorn'd.

DRYDEN.

Hence it appears, that though ſentimental love does not ſo frequently ariſe ſpontaneouſly in female boſoms, yet that it is liable to become as violent, when it has been excited by the courtſhip of the other ſex, and though, when it is rejected, after courtſhip has produced it, it is not always ſucceeded by ſuch violent effects as thoſe above mentioned; which may be aſcribed to the greater modeſty, and reſerve of their education; yet the diſappointed paſſion is liable to prey upon their minds even to the hazard of their lives, of which I have witneſſed two inſtances, in both which the effects approached to that occaſioned by great grief. See Mœror, Claſs III. 1. 2. 10.

One of theſe ladies, about 30 years of age, was deſerted by an Iriſh gentleman, who was ſoon to have married her; ſhe was ſeized ſuddenly with a ſtupor, which by thoſe, who were not acquainted with the cauſe, was miſtaken for a kind of apoplexy; ſhe gradually recovered ſo as to apply to her uſual habits of life, and in four or five years regained her cheerfulneſs, and married another man. The other was affected with long ſtupor, loſs of digeſtion, and total inability of mind and body, which continued a year or two, and from which ſhe alſo gradually recovered.

5. *Amor*

5. *Amor ſui.* Vanity conſiſts of an agreeable reverie, and is well ridiculed in the ſtory of Narciſſus, who ſo long contemplated his own beautiful image in the water, that he died from neglect of taking ſuſtenance. I once ſaw a handſome young man, who had been ſo much flattered by his parents, that his vanity roſe ſo near to inſanity, that one might diſcern by his perpetual attention to himſelf, and the difficulty with which he arranged his converſation, that the idea of himſelf intruded itſelf at every comma or pauſe of his diſcourſe. In this degree vanity muſt afford great pleaſure to the poſſeſſor; and when it exiſts within moderate bounds, may contribute much to the happineſs of ſocial life.

My friend Mr. —— once complained to me, that he was much troubled with baſhfulneſs in company, and believed that it aroſe from his want of perſonal vanity; on this account he determined on a journey to Paris, when Paris was the centre of politeneſs; he there learnt to dreſs, to dance, and to move his hands graceſully in converſation; and returned a moſt conſummate coxcomb. But after a very few years he relapſed into ruſticity of dreſs and manners.

M. M. The cure of vanity may be attempted by exceſs of flattery, which will at length appear ridiculous, or by its familiarity will ceaſe to be deſired. I remember to have heard a ſtory of a nobleman in the court of France, when France had a

court, who was ſo diſagreeably vain in converſation, that the king was pleaſed to direct his cure, which was thus performed. Two gentlemen were directed always to attend him, one was to ſtand behind his chair, and the other at a reſpectful diſtance before him; whenever his lordſhip began to ſpeak, one of them always pronounced, "Lord Gallimaufre is going to ſay the beſt thing in the world." And, as ſoon as his lordſhip had done ſpeaking, the other attendant pronounced, "Lord Gallimaufre has ſpoken the beſt thing in the world." Till in a few weeks this noble lord was ſo diſguſted with praiſe that he ceaſed to be vain; and his majeſty diſmiſſed his keepers.

6. *Noſtalgia.* Maladie de Pais. Calenture. An unconquerable deſire of returning to one's native country, frequent in long voyages, in which the patients become ſo inſane as to throw themſelves into the ſea, miſtaking it for green fields or meadows. The Swiſs are ſaid to be particularly liable to this diſeaſe, and when taken into foreign ſervice frequently to deſert from this cauſe, and eſpecially after hearing or ſinging a particular tune, which was uſed in their village dances, in their native country, on which account the playing or ſinging this tune was forbid by the puniſhment of death. Zwingerus.

> Dear is that ſhed, to which his ſoul conforms,
> And dear that hill, which lifts him to the ſtorms.
>
> GOLDSMITH.

7. *Spes*

7. *Spes religiosa.* Superstitious hope. This maniacal hallucination in its milder state produces, like sentimental love, an agreeable reverie; but when joined with works of supererogation, it has occasioned many enormities. In India devotees consign themselves by vows to most painful and unceasing tortures, such as holding up their hands, till they cannot retract them; hanging up by hooks put into the thick skin over their shoulders, sitting upon sharp points, and other self torments. While in our part of the globe fasting and mortification, as flagellation, has been believed to please a merciful deity! The serenity, with which many have suffered cruel martyrdoms, is to be ascribed to this powerful reverie.

Mr. ——, a clergyman, formerly of this neighbourhood, began to bruise and wound himself for the sake of religious mortification, and passed much time in prayer, and continued whole nights alone in the church. As he had a wife and family of small children, I believed the case to be incurable; as otherwise the affection and employment in his family connections would have opposed the beginning of this insanity. He was taken to a madhouse without effect, and after he returned home, continued to beat and bruise himself, and by this kind of mortification, and by sometimes long fasting, he at length became emaciated and died. I once told him in

 conversation,

converſation, that "God was a merciful being, and could not delight in cruelty, but that I ſuppoſed he worſhipped the devil." He was ſtruck with this idea, and promiſed me not to beat himſelf for three days, and I believe kept his word for one day. If this idea had been frequently forced on his mind, it might probably have been of ſervice.

When theſe works of ſupererogation have been of a public nature, what cruelties, murders, maſſacres, has not this inſanity introduced into the world!—A commander, who had been very active in leading and encouraging the bloody deeds of St. Bartholomew's day at Paris, on confeſſing his ſins to a worthy eccleſiaſtic on his death-bed, was aſked, "Have you nothing to ſay about St. Bartholomew?" "On that day," he replied, "God Almighty was obliged to me!"—The fear of Hell is another inſanity, which will be ſpoken of below.

8. *Superbia ſtemmatis.* Pride of family has frequently formed a maniacal hallucination, which in its mild ſtate has conſiſted in agreeable reverie, but when it has been ſo painful as to demand homage from others, it has frequently induced inſane exertions. This inſanity ſeems to have exiſted in the flouriſhing ſtate of Rome, as now all over Germany, and is attacked by Juvenal

venal with great ſeverity, a ſmall part of which I ſhall here give as a method of cure. Sat. 8.

Say, what avails the pedigree, that brings
Thy boaſted line from heroes or from kings;
Though many a mighty lord, in parchment roll'd,
Name after name, thy coxcomb hands unfold;
Though wreathed patriots crowd thy marble halls,
Or ſteel-clad warriors frown along the walls;
While on broad canvas in the gilded frame
All virtues flouriſh, and all glories flame?—
Say,—if ere noon with idiot laugh you lie
Wallowing in wine, or cog the dubious die,
Or act unſhamed, by each indignant buſt,
The midnight orgies of promiſcuous luſt!——
Go, lead mankind to Virtue's holy ſhrine,
With morals mend them, and with arts refine,
Or lift, with golden characters unfurl'd,
The flag of peace, and ſave a warring world!—
—So ſhall with pious hands immortal Fame
Wreathe all her laurels round thy honour'd name,
High o'er thy tomb with chiſſel bold engrave,
"THE TRULY NOBLE ARE THE GOOD AND BRAVE."

9. *Ambitio.* Inordinate deſire of fame. A careleſſneſs about the opinions of others is ſaid by Xenophon to be the ſource of impudence; certainly a proper regard for what others think of us frequently incites us to virtuous actions, and deters us from vicious ones; and increaſes our happineſs by enlarging our ſphere of ſympathy, and by flattering our vanity.

Abſtract what others feel, what others think,
All pleaſures ſicken, and all glories ſink.

POPE.

When this reverie of ambition excites to conquer nations, or to enſlave them, it has been the ſource of innumerable wars, and the occaſion of a great devaſtation of mankind. Cæſar is reported to have boaſted, that he had deſtroyed three millions of his enemies, and one million of his friends.

The works of Homer are ſuppoſed to have done great injury to mankind by inſpiring the love of military glory. Alexander was ſaid to ſleep with them always on his pillow. How like a mad butcher amid a flock of ſheep appears the hero of the Iliad, in the following fine lines of Mr. Pope, which conclude the twentieth book.

His fiery courſers, as the chariot rolls,
Tread down whole ranks, and cruſh out heroes' ſouls;
Daſh'd from their hoofs, as o'er the dead they fly,
Black bloody drops the ſmoking chariot dye;—
The ſpiky wheels through heaps of carnage tore,
And thick the groaning axles dropp'd with gore;
High o'er the ſcene of death ACHILLES ſtood,
All grim with duſt, all horrible with blood;
Yet ſtill inſatiate, ſtill with rage on flame,
Such is the luſt of never dying fame!

The cure muſt be taken from moral writers. Woolaſton ſays, Cæſar conquered Pompey; that is,

is, a man whofe name confifted of the letters C, æ, f, a, r, conquered a long time ago a man, whofe name confifted of the letters P, o, m, p, e, y, and that this is all that remains of either of them. Juvenal alfo attacks this mode of infanity, Sat. X. 166.

> I, demens, et fævas curre per Alpes,
> Ut pueris placeas, et declamatio fias!

Which is thus tranflated by Dr. Johnfon,

> And left a name, at which the world grew pale,
> To point a moral, or adorn a tale!

10. *Mœror.* Grief. A perpetual voluntary contemplation of all the circumftances of fome great lofs, as of a favourite child. In general the painful ideas gradually decreafe in energy, and at length the recollection becomes more tender and lefs painful. The letter of Sulpicius to Cicero on the lofs of his daughter is ingenious. The example of David on the lofs of his child is heroic.

A widow lady was left in narrow circumftances with a boy and a girl, two beautiful and lively children, the one fix, and the other feven years of age; as her circumftances allowed her to keep but one maid-fervant, thefe two children were the fole attention, employment, and confolation of her life; fhe fed them, dreffed them, flept with them, and taught them herfelf; they were both fnatched from her by the gangrenous fore throat in one week: fo

that ſhe loſt at once all that employed her, as well as all that was dear to her. For the firſt three or four days after their death, when any friend viſited her, ſhe ſat upright, with her eyes wide open, without ſhedding tears, and affected to ſpeak of indifferent things. Afterwards ſhe began to weep much, and for ſome weeks talked to her friends of nothing elſe but her dear children. But did not for many years, even to her dying hour, get quite over a gloom, which was left upon her countenance.

In violent grief, when tears flow, it is eſteemed a good ſymptom; becauſe then the actions cauſed by ſenſitive aſſociation take the place of thoſe cauſed by volition; that is, they prevent the voluntary exertions of ideas, or muſcular actions, which conſtitute inſanity.

The ſobbing and ſighing attendant upon grief are not convulſive movements, they are occaſioned by the ſenſorial power being ſo expended on the painful ideas, and their connections, that the perſon neglects to breathe for a time, and then a violent ſigh or ſob is neceſſary to carry on the blood, which oppreſſes the pulmonary veſſels, which is then performed by deep or quick inſpirations, and laborious expirations. Sometimes nevertheleſs the breath is probably for a while voluntarily held, as an effort to relieve pain. The paleneſs and ill health occaſioned by long grief are ſpoken of in Claſs IV. 2. 1. 9.

The melioration of grief by time, and its being

ing at length even attended with pleaſure, depends on our retaining a diſtinct idea of the loſt object, and forgetting for a time the idea of the loſs of it. This pleaſure of grief is beautifully deſcribed by Akenſide. Pleaſures of Imagination, Book II. l. 680.

——————Aſk the faithful youth,
Why the cold urn of her, whom long he loved,
So often fills his arms; ſo often draws
His lonely footſteps at the ſilent hour
To pay the mournful tribute of his tears?
Oh! he will tell thee, that the wealth of worlds
Should ne'er ſeduce his boſom to forego
That ſacred hour; when, ſtealing from the noiſe
Of care and envy, ſweet remembrance ſoothes
With Virtue's kindeſt looks his aching breaſt,
And turns his tears to rapture.

M. M. Conſolation is beſt ſupplied by the Chriſtian doctrine of a happy immortality. In the Pagan religion the power of dying was the great conſolation in irremediable diſtreſs. Seneca ſays, "no one need be unhappy unleſs by his own fault." And the author of Telemachus begins his work by ſaying, that Calypſo could not conſole herſelf for the loſs of Ulyſſes, and found herſelf unhappy in being immortal. In the firſt hours of grief the method of conſolation uſed by uncle Toby, in Triſtram Shandy, is probably the beſt; "he ſat down in an arm chair by the bed of his diſtreſſed friend, and ſaid nothing."

11. *Tædium*

11. *Tædium vitæ.* Ennui. Irkſomeneſs of life. The inanity of ſublunary things has afforded a theme to philoſophers, moraliſts, and divines, from the earlieſt records of antiquity; "Vanity of vanities!" ſays the preacher, "all is vanity!" Solomon. "Man is the dream of a ſhadow!" Σκιας ωναρ ανθρωπος. Pindar. O! quantum eſt in rebus inane! Juvenal. Nor is there any one, I ſuppoſe, who has paſſed the meridian of life, who has not at ſome moments felt the nihility of all things.

Wearineſs of life or ennui in its moderate degree has been eſteemed a motive to action by ſome philoſophers. See Sect. XXXIV. 2. 3. But in thoſe men, who have run through the uſual amuſements of life early in reſpect of their age; and who have not induſtry or ability to cultivate thoſe ſciences, which afford a perpetual fund of novelty, and of conſequent entertainment, are liable to become tired of life, as they ſuppoſe there is nothing new to be found in it, that can afford them pleaſure; like Alexander, who is ſaid to have ſhed tears becauſe he had not another world to conquer.

Mr. ————, a gentleman, about fifty, of poliſhed manners, who in a few months afterwards deſtroyed himſelf, ſaid to me one day, "A ride out in the morning, and a warm parlour and a pack of cards in the afternoon, are all that life affords." He was perſuaded

to

to have an iſſue on the top of his head, as he complained of a dull head-ach, which being unſkilfully managed, deſtroyed the pericranium to the ſize of an inch in diameter; during the time this took in healing, he was indignant about it, and endured life, but ſoon afterwards ſhot himſelf.

Mr. ——, a gentleman of Gray's Inn, ſome years ago was prevailed upon by his friends to diſmiſs a miſtreſs, by whom he had a child, but who was ſo great a termagant and ſcold, that ſhe was believed to uſe him very ill, and even to beat him. He became melancholy in two days from the want of his uſual ſtimulus to action, and cut his throat on the third ſo completely, that he died immediately.

Mr. Anſon, the brother to the late lord Anſon, related to me the following anecdote of the death of lord Sc——. His lordſhip ſent to ſee Mr. Anſon on the Monday preceding his death, and ſaid, "You are the only friend I value in the world, I determined therefore to acquaint you, that I am tired of the inſipidity of life, and intend to-morrow to leave it." Mr. Anſon ſaid, after much converſation, that he was obliged to leave town till Friday, and added, "As you profeſs a friendſhip for me, do me this laſt favour, I entreat you, live till I return." Lord Sc—— believed this to be a pious artifice to gain time, but nevertheleſs agreed, if he ſhould return by four o'clock

o'clock on that day. Mr. Anſon did not return till five, and perceived by the countenances of the domeſtics, that the deed was done. He went into his chamber and found the corpſe of his friend leaning over the arm of a great chair, with the piſtol on the ground by him, the ball of which had been diſcharged into the roof of his mouth, and paſſed into his brain.

Mr. —— and Mr. ——, two young men, heirs to conſiderable fortunes, ſhot themſelves at the age of four or five and twenty, without their friends being able to conjecture any cauſe for thoſe raſh actions. One of them I had long known to expreſs himſelf with diſſatisfaction of the world; at eighteen years of age he complained, that he could not entertain himſelf; he tried to ſtudy the law at Cambridge, and afterwards went abroad for a year or two by my advice; but returned diſſatisfied with all things. As he had an eruption for ſome years on a part of his face, which he probably endeavoured to remove by external applications; I was induced to aſcribe his perpetual ennui to the pain or diſagreeable ſenſation of a diſeaſed liver. The other young gentleman ſhot himſelf in his bedroom, and I was informed that there was found written on a ſcrap of paper on his table, "I am impotent, and therefore not fit to live." From whence there was reaſon to conclude, that this

was

was the hallucinatio maniacalis, the delirious idea, which caufed him to deftroy himfelf. The cafe therefore belongs to mania mutabilis, and not to tædium vitæ.

Thofe, who have been employed during the firft half of their lives in fome very active bufinefs, and fuddenly leave it, are liable to this kind of infanity, and even to fuicide; of which I have known two inftances, one of them a Birmingham manufacturer, and the other a great and fuccefsful commander. This may be afcribed to the accumulation of the fenforial power of volition, and the want of motive to exert or expend it, and which thence becomes painful. See pain of cold from the want of ftimulus. III. 2. 1. 17.

This may afford confolation to thofe, whofe fituation in life obliges them to ufe perpetual induftry in their occupations: they may fay, that as they have been long in the habit of exerting much voluntary action, they muft continue to employ themfelves; otherwife that they fhall fink into low fpirits, as it is called, and become unhappy. And as the continuance of activity is now neceffary to their happinefs, they had better employ themfelves on fuch objects, as are ufeful to themfelves or their connections, than to confume their time, and mifapply their labour, in card-playing, wine-drinking, or fox-hunting, which are other methods of relieving ennui or the

irkſomeneſs of life by exertion, and conſequent expenditure of voluntary power.

Leſs degrees of this malady are erroneouſly termed hypochondriaciſm, ſee Claſs I. 2. 4. 10. by the people, and are generally aſcribed to the want of voluntary power, or of induſtry; but I believe it is generally owing to want of motive or ſtimulus; and that the pain attending this ſtate of our ideas or muſcles is occaſioned by accumulation of voluntary power, as above mentioned. The cure of this diſeaſe, is popularly known to conſiſt in any kind of voluntary exertion of the mind, or of the body; one of our poets has perſonified hypochondriaciſm, and well adviſes the uſe of exerciſe, or exertion to oppoſe the monſter, and ſays,

"Throw but a ſtone, the giant dies."

To this ſhould be added, that thoſe, who have been educated in indolence, do not find or feel ennui, or the pain of exiſtence, when they are inactive; like our domeſtic animals, as dogs and cats, who ſleep by the fire without inclination to hang or drown themſelves; as theſe beings, not having been long accuſtomed to expend much voluntary power, are not liable to much accumulation of it, and uneaſineſs in conſequence; which is not ſo however with the more active ſquirrel before mentioned.

But on the contrary, thoſe, whoſe education has

has induced them to uſe much voluntary exertion, and have afterwards had no active employment, as happens to ſome unmarried ladies, are more liable, as I have repeatedly witneſſed, to this malady; an idea, which ſhould be attended to in female education.

Another ſource of ennui or tædium vitæ is alſo derived from wrong education, and is immediately owing to the want of ſtimulus rather than to the great accumulation of voluntary power; and is liable to attend ſome ladies in high life, whoſe exertions during their early years were excited by the flattery of numerous menial ſervants. And afterwards, when this flattery ceaſes by their living with their equals, they want their accuſtomed motive to activity, and in conſequence become indolent and unhappy, as further deſcribed in Claſs III. 2. 1. 8. under the name of Pareſis voluntaria.

M. M. The prevention of this malady muſt conſiſt in the due care of education. Thoſe who are not deſigned for very active life, particularly young ladies, ſhould not be forced in their early years to uſe too violent or too conſtant voluntary exertions. They ſhould not be flattered into all their exertions, but ſhould be taught to act from duty to themſelves and others, or for their future advantage as well as for their preſent amuſement.

Some reſtraint in exhauſting the uſual pleaſures of the world in early life ſhould be laid on

young men of fortune; and afterwards the pleasures and solitudes of a matrimonial life are strongly to be recommended; and finally the cultivation of science, as of chemistry, natural philosophy, natural history, which supplies an inexhaustible source of pleasurable novelty, and relieves ennui by the exertions it occasions.

In many of these cases, when irksomeness of life has been the ostensible cause of suicide, there has probably existed a maniacal hallucination, a painful idea, which the patient has concealed even to his dying hour; except where the mania has evidently arisen from hereditary or acquired disease of the membranous or glandular parts of the system.

12. *Pulchritudinis desiderium.* The loss of beauty, either by disease, as by the small-pox, or by age, as life advances, is sometimes painfully felt by ladies, who have been much flattered on account of it. There is a curious case of this kind related in le Sage's Bachelor of Salamanca, which is too nicely described to be totally imaginary.

In this situation some ladies apply to what are termed cosmetics under various names, which crowd the newspapers. Of these the white has destroyed the health of thousands; a calx, or magistery, of bismuth is supposed to be sold in the shops for this purpose; but it is either, I am informed, in part or entirely white lead or cerussa.

The

The pernicious effects of the external uſe of thoſe ſaturnine applications are ſpoken of in gutta roſea, Claſs II. 1. 4. 6. The real calx of biſmuth would probably have the ſame ill effect. As the red paint is prepared from cochineal, which is an animal body, leſs if any injury ariſes from its uſe, as it only lies on the ſkin like other filth.

The tan of the ſkin occaſioned by the ſun may be removed by lemon juice evaporated by the fire to half its original quantity, or by diluted marine acid; which cleans the cuticle, by eroding its ſurface, but requires much caution in the application; the marine acid muſt be diluted with water, and then put upon the hand or face, after a ſecond of time, as ſoon as the tan diſappears, the part muſt be waſhed with a wet towel and much warm water. Freckles lie too deep for this operation, nor are they in general removable by a bliſter, as I once experienced. See Claſs I. 2. 2. 9.

It is probable, that thoſe materials which ſtain ſilk, or ivory, might be uſed to ſtain the cuticle, or hair, permanently; as they are all animal ſubſtances. But I do not know, that any trials of this kind have been made on the ſkin. I endeavoured in vain to whiten the back of my hand by marine acid oxygenated by manganeſe, which ſo inſtantly whitens cotton.

The cure therefore muſt be ſought from moral

writers, and the cultivation of the graces of the mind, which are frequently a more valuable poſſeſſion than celebrated beauty.

13. *Paupertatis timor.* The fear of poverty is one kind of avarice; it is liable to affect people who have left off a profitable and active buſineſs; as they are thus deprived of their uſual exertions, and are liable to obſerve the daily expenditure of money, without calculating the ſource from whence it flows. It is alſo liable to occur with a ſudden and unexpected increaſe of fortune. Mr. ——, a ſurgeon, about fifty years of age, who was always rather of a parſimonious diſpoſition, had a large houſe, with a fortune of forty thouſand pounds, left him by a diſtant relation; and in a few weeks became inſane from the fear of poverty, lamenting that he ſhould die in a jail or a workhouſe. He had left off a laborious country buſineſs, and the daily perception of profit in his books; he alſo now ſaw greater expenſes going forwards in his new houſe, than he had been accuſtomed to obſerve, and did not ſo diſtinctly ſee the ſource of ſupply; which ſeems to have occaſioned the maniacal hallucination.—This idea of approaching poverty is a very frequent and very painful diſeaſe, ſo as to have induced many to become ſuicides, who were in good circumſtances; more perhaps than any other maniacal hallucination, except the fear of Hell.

The

The covetouſneſs of age is more liable to affect ſingle men, than thoſe who have families; though an accumulation of wealth would ſeem to be more deſirable to the latter. But an old man in the former ſituation, has no perſonal connections to induce him to open his purſe; and having loſt the friends of his youth, and not eaſily acquiring new ones, feels himſelf alone in the world: feels himſelf unprotected, as his ſtrength declines, and is thus led to depend for aſſiſtance on money, and on that account wiſhes to accumulate it. Whereas the father of a family has not only thoſe connections, which demand the frequent expenditure of money, but feels a conſolation in the friendſhip of his children, when age may render their good offices neceſſary to him.

M. M. I have been well informed of a medical perſon in good circumſtances in London, who always carries an account of his affairs, as debtor and creditor, in his pocket-book; and looks over it frequently in a day, when this diſeaſe returns upon him; and thus, by counteracting the maniacal hallucination, wiſely prevents the increaſe of his inſanity. Another medical perſon, in London, is ſaid to have cured himſelf of this diſeaſe by ſtudying mathematics with great attention; which exertion of the mind relieved the pain of the maniacal hallucination.

Many moral writers have ſtigmatiſed this infa-

nity; the covetous, they ſay, commit crimes and mortify themſelves without hopes of reward; and thus become miſerable both in this world and the next. Thus Juvenal:

Cum furor haud dubius, cum ſit manifeſta phrenitis,
Ut locuples moriaris, egenti vivere fato!

The covetous man thought he gave good advice to the ſpendthrift, when he ſaid, "Live like me," who well anſwered him,

——————"Like you, Sir John?
"That I can do, when all I have is gone!" POPE.

14. *Lethi timor.* The fear of death perpetually employs the thoughts of theſe patients; hence they are deviſing new medicines, and applying to phyſicians and quacks without number. It is confounded with hypochondriaſis, Claſs I. 2. 3. 9. in popular converſation, but is in reality an inſanity.

A young gentleman, whom I adviſed to go abroad as a cure for this diſeaſe, aſſured me, that during the three years he was in Italy and France he never paſſed a quarter of an hour without fearing he ſhould die. But he has now for above twenty years experienced the contrary.

The ſufferers under this malady are generally at once diſcoverable by their telling you, amidſt an unconnected deſcription of their complaints,

that

that they are nevertheleſs not afraid of dying. They are alſo eaſily led to complain of pains in almoſt any part of the body, and are thus ſoon diſcovered.

M. M. As the maniacal hallucination has generally ariſen in early infancy from ſome dreadful account of the ſtruggles and pain of dying, I have ſometimes obſerved, that theſe patients have received great conſolation from the inſtances I have related to them of people dying without pain. Some of theſe, which I think curious, I ſhall conciſely relate, as a part of the method of cure.

Mr. ——, an elderly gentleman, had ſent for me one whole day before I could attend him; on my arrival he ſaid he was glad to ſee me, but that he was now quite well, except that he was weak, but had had a pain in his bowels the day before. He then lay in bed with his legs cold up to the knees, his hands and arms cold, and his pulſe ſcarcely diſcernible, and died in about ſix hours. Mr. ——, another gentleman about ſixty, lay in the act of dying, with difficult reſpiration like groaning, but in a kind of ſtupor or coma vigil, and every ten or twelve minutes, while I ſat by him, he waked, looked up, and ſaid, "who is it groans ſo, I am ſure there is ſomebody dying in the room," and then ſunk again into a kind of ſleep. From theſe two

caſes there appeared to be no pain in the act of dying, which may afford conſolation to all, but particularly to thoſe who are afflicted with the fear of death.

15. *Orci timor.* The fear of Hell. Many theatric preachers among the Methodiſts ſucceſsfully inſpire this terror, and live comfortably upon the folly of their hearers. In this kind of madneſs the poor patients frequently commit ſuicide; although they believe they run headlong into the Hell, which they dread! Such is the power of oratory, and ſuch the debility of the human underſtanding!

Thoſe, who ſuffer under this inſanity, are generally the moſt innocent and harmleſs people; who are then liable to accuſe themſelves of the greateſt imaginary crimes, and have ſo much intellectual cowardice, that they dare not reaſon about thoſe things, which they are directed by their prieſts to believe, however contradictory to human apprehenſion, or derogatory to the great Creator of all things. The maniacal hallucination at length becomes ſo painful, that the poor inſane flies from life to become free from it.

M. M. Where the intellectual cowardice is great, the voice of reaſon is ineffectual; but that of ridicule may ſave many from thoſe mad-making doctors; though it is too weak to cure thoſe, who

who are already hallucinated. Foote's Farces are recommended for this purpofe.

16. *Satyriafis.* An ungovernable defire of venereal indulgence. The remote caufe is probably the ftimulus of the femen; whence the phallus becomes diftended with blood by the arterial propulfion of it being more ftrongly excited than the correfpondent venous abforption. At the fame time a new fenfe is produced in the other termination of the urethra; which, like itching, requires fome exterior friction to facilitate the removal of the caufe of the maniacal actions, which may probably be increafed in thofe cafes by fome affociated hallucinations of ideas. It differs from priapifmus chronicus in the defire of its appropriated object, which is not experienced in the latter, Clafs I. 1. 4. 6. and from the priapifmus amatorius, Clafs II. 1. 7. 9. in the maniacal actions in confequence of defire. The furor uterinus, or nymphomania, is a fimilar difeafe.

M. M. Venefection. Cathartics. Torpentia. Marriage.

17. *Ira.* Anger is caufed by offended pride. We are not angry at breaking a bone, but become quite infane from the fmalleft ftroke of a whip from an inferior. Ira furor brevis. Anger is not only itfelf a temporary madnefs, but is a

frequent attendant on other infanities, and as, whenever it appears, it diſtinguiſhes inſanity from delirium, it is generally a good ſign in fevers with debility.

An injury voluntarily inflicted on us by others excites our exertions of ſelf-defence or of revenge againſt the perpetrator of it; but anger does not ſucceed in any great degree unleſs our pride is offended; this idea is the maniacal hallucination, the pain of which ſometimes produces ſuch violent and general exertions of our muſcles and ideas, as to diſappoint the revenge we meditate, and vainly to exhauſt our ſenſorial power. Hence angry people, if not further excited by diſagreeable language, are liable in an hour or two to become humble, and ſorry for their violence, and willing to make greater conceſſions than required.

M. M. Be ſilent, when you feel yourſelf angry. Never uſe loud oaths, violent upbraidings, or ſtrong expreſſions of countenance, or geſticulations of the arms, or clenched fiſts; as theſe by their former aſſociations with anger will contribute to increaſe it. I have been told of a ſergeant or corporal, who began moderately to cane his ſoldiers, when they were awkward in their exerciſe, but being addicted to ſwearing and coarſe language, he uſed ſoon to enrage himſelf by his own expreſſions of anger, till toward the end he was liable to beat the delinquents unmerciſully.

18. *Rabies.*

18. *Rabies.* Rage. A defire of biting others, moft frequently attendant on canine madnefs. Animals in great pain, as in the colica faturnina, are faid to bite the ground they lie upon, and even their own flefh. I have feen patients bite the attendants, and even their own arms, in the epilepfia dolorifica. It feems to be an exertion to relieve pain, as explained in Sect. XXXIV. 1. 3. The dread of water in hydrophobia is occafioned by the repeated painful attempts to fwallow it, and is therefore not an effential or original part of the difeafe called canine madnefs. See Clafs III. 1. 1. 15.

There is a mania reported to exift in fome parts of the eaft, in which a man is faid to run a muck; and thefe furious maniacs are believed to have induced their calamity by unlucky gaming, and afterwards by taking large quantities of opium; whence the pain of defpair is joined with the energy of drunkennefs; they are then faid to fally forth into the moft populous ftreets, and to wound and flay all they meet, till they receive their own death, which they defire to procure without the greater guilt, as they fuppofe, of fuicide.

M. M. When there appears a tendency to bite in the painful epilepfy, the end of a rolled up towel, or a wedge of foft wood, fhould be put into the mouth of the patient. As a bullet is faid fometimes to be given to a foldier, who is

to

to be ſeverely flogged, that he may by biting it better bear his puniſhment.

19. *Citta.* A deſire to ſwallow indigeſtible ſubſtances. I once ſaw a young lady, about ten years of age, who filled her ſtomach with the earth out of a flower-pot, and vomited it up with ſmall ſtones, bits of wood, and wings of inſects amongſt it. She had the bombycinous complexion, and looked like a chlorotic patient, though ſo young; this generally proceeds from an acid in the ſtomach.

M. M. A vomit. Magneſia alba. Armenian bole. Rhubarb. Bark. Steel. A bliſter. See Claſs I. 2. 4. 5.

20. *Cacoſitia.* Averſion to food. This may ariſe, without diſeaſe of the ſtomach, from connecting nauſeous ideas to our uſual food, as by calling a ham a hog's a——. This madneſs is much inculcated by the ſtoic philoſophy. See Antoninus' Meditations. See two caſes of patients who refuſed to take nouriſhment, Claſs III. 1. 2. 1.

Averſions to peculiar kinds of food are thus formed early in life by aſſociation of ſome maniacal hallucination with them. I remember a child, who on taſting the griſtle of ſturgeon, aſked what griſtle was? And being told it was like the diviſion of a man's noſe, received an ideal hallucination;

hallucination; and for twenty years afterwards could not be perſuaded to taſte ſturgeon.

The great fear or averſion, which ſome people experience at the ſight of ſpiders, toads, crickets, and the like, have generally had a ſimilar origin.

M. M. Aſſociate agreeable ideas with thoſe which diſguſt; as call a ſpider ingenious, a frog clean and innocent; and repreſs all expreſſions of diſguſt by the countenance, as ſuch expreſſions contribute to preſerve, or even to increaſe the energy of the ideas aſſociated with them; as mentioned above in Species 17. Ira.

21. *Syphilis imaginaria.* The fear that they are infected with the venereal diſeaſe, when they have only deſerved it, is a very common inſanity amongſt modeſt young men; and is not to be cured without applying artfully to the mind; a little mercury muſt be given, and hopes of a cure added weekly and gradually by interview or correſpondence for ſix or eight weeks. Many of theſe patients have been repeatedly ſalivated without curing the mind!

22. *Pſora imaginaria.* I have twice ſeen an imaginary itch, and twice an imaginary diabetes, where there was not the leaſt veſtige of either of thoſe diſeaſes, and once an imaginary deafneſs, where the patient heard perfectly well. In all

theſe

thefe cafes the hallucinated idea is fo powerfully excited, that it is not to be changed fuddenly by ocular fenfation, or reafon. Yet great perfeverance in the frequently prefenting contrary ideas will fometimes flowly remove this hallucination, or in great length of time oblivion, or forgetfulnefs, performs a cure, by other means in vain attempted.

23. *Tabes imaginaria.* This imaginary difeafe, or hallucination, is caufed by the fuppofed too great frequency of parting with the femen, and had long impofed upon the phyfician as well as the patient, till Mr. John Hunter firft endeavoured to fhew, that in general the morbid effects of this pollution were in the imagination; and that thofe were only liable to thofe effects in general, who had been terrified by the villainous books, which pretend to prevent or to cure it, but which were purpofely written to vend fome quack medicine. Moft of thofe unhappy patients, whom I have feen, had evidently great impreffion of fear and felf-condemnation on their minds, and might be led to make contradictory complaints in almoft any part of the body, and if their confeffions could be depended on, had not ufed this pollution to any great excefs.

M. M. 1. Affure them if the lofs of the femen happens but twice a week, it will not injure them. 2. Marry them. The laft is a certain cure;

cure; whether the diſeaſe be real or imaginary. Cold partial bath, and aſtringent medicines frequently taken, only recal the mind to the diſeaſe, or to the delinquency; and thence increaſe the imaginary effects and the real cauſe, if ſuch exiſts. Mr. —— deſtroyed himſelf to get free from the pain of fear of the ſuppoſed ill conſequences of ſelf-pollution, without any other apparent diſeaſe; whoſe parents I had in vain adviſed to marry him, if poſſible.

24. *Sympathia aliena.* Pity. Our ſympathy with the pleaſures and pains of others diſtinguiſhes men from other animals; and is probably the foundation of what is termed our moral ſenſe; and the ſource of all our virtues. See Sect. XXII. 3. 3. When our ſympathy with thoſe miſeries of mankind, which we cannot alleviate, riſes to exceſs, the mind becomes its own tormentor; and we add to the aggregate ſum of human miſery, which we ought to labour to diminiſh; as in the following eloquent lamentation from Akenſide's Pleaſures of Imagination, Book II. 1. 200.

——— ——— Dark,
As midnight ſtorms, the ſcene of human things
Appear'd before me; deſerts, burning ſands,
Where the parch'd adder dies; the frozen ſouth;
And deſolation blaſting all the weſt
With rapine and with murder. Tyrant power
Here ſits enthroned in blood; the baleful charms
Of ſuperſtition there infect the ſkies,

And

And turn the ſun to horror. Gracious Heaven!
What is the life of man? Or cannot theſe,
Not theſe portents thy awful will ſuffice?
That, propagated thus beyond their ſcope,
They riſe to act their cruelties anew
In my afflicted boſom, thus decreed
The univerſal ſenſitive of pain,
The wretched heir of evils not its own!

A poet of antiquity, whoſe name I do not recollect, is ſaid to have written a book deſcribing the miſeries of the world, and to have deſtroyed himſelf at the concluſion of his taſk. This ſympathy, with all ſenſitive beings, has been carried ſo far by ſome individuals, and even by whole tribes, as the Gentoos, as not only to reſtrain them from killing animals for their ſupport, but even to induce them to permit inſects to prey upon their bodies. Such is however the condition of mortality, that the firſt law of nature is, "Eat or be eaten." We cannot long exiſt without the deſtruction of other animal or vegetable beings, either in their mature or their embryon ſtate. Unleſs the fruits, which ſurround the ſeeds of ſome vegetables, or the honey ſtolen from them by the bee, may be ſaid to be an exception to this aſſertion. See Botanic Garden, P. I. Cant. I. l. 278. Note. Hence, from the neceſſity of our nature, we may be ſuppoſed to have a right to kill thoſe creatures, which we want to eat, or which want to eat us. But to

deſtroy

deſtroy even inſects wantonly ſhews an unreflecting mind or a depraved heart.

Nevertheleſs mankind may be well divided into the ſelfiſh and the ſocial; that is, into thoſe whoſe pleaſures ariſe from gratifying their appetites, and thoſe whoſe pleaſures ariſe from their ſympathizing with others. And according to the prevalence of theſe oppoſing propenſities we value or diſlike the poſſeſſor of them.

In conducting the education of young people, it is a nice matter to inſpire them with ſo much benevolent ſympathy, or compaſſion, as may render them good and amiable; and yet not ſo much as to make them unhappy at the ſight of incurable diſtreſs. We ſhould endeavour to make them alive to ſympathize with all remediable evils, and at the ſame time to arm them with fortitude to bear the ſight of ſuch irremediable evils, as the accidents of life muſt frequently preſent before their eyes. About this I have treated more at large in a plan for the conduct of a boarding-ſchool for ladies, which I intend to publiſh in the courſe of the next year.

25. *Educatio heroica.* From the kinds and degrees of inſanities already enumerated, the reader will probably recollect many more from his own obſervation; he will perceive that all extraordinary exertions of voluntary action in conſequence

of ſome falſe idea or hallucination, which ſtrongly affects us, may philoſophically, though not popularly, be termed an inſanity; he will then be liable to divide theſe voluntary exertions into diſagreeable, pernicious, deteſtable, or into meritorious, delectable, and even amiable, inſanities. And will laſtly be induced to conceive, that a good education conſiſts in the art of producing ſuch happy hallucinations of ideas, as may be followed by ſuch voluntary exertions, as may be termed meritorious or amiable inſanities.

The old man of the mountain in Syria, who governed a ſmall nation of people called Aſſaſſines, is recorded thus to have educated thoſe of his army who were deſigned to aſſaſſinate the princes with whom he was at war. A young man of natural activity was choſen for the purpoſe, and thrown into a deep ſleep by opium mixed with his food; he was then carried into a garden made to repreſent the paradiſe of Mahomet, with flowers of great beauty and fragrance, fruits of delicious flavour, and beautiful Houries beckoning him into the ſhades. After a while, on being a ſecond time ſtupified with opium, the young enthuſiaſt was reconveyed to his apartment; and on the next day was aſſured by a prieſt, that he was deſigned for ſome great exploit, and that by obeying the commands of their prince, immortal happineſs awaited him.

Hence

Hence it is eaſy to collect how the firſt impreſſions made on us by accidental circumſtances in our infancy continue through life to bias our affections, or miſlead our judgments. One of my acquaintance can trace the origin of his own energies of action from ſome ſuch remote ſources, which juſtifies the obſervation of M. Rouſſeau, that the ſeeds of future virtues or vices are oftener ſown by the mother than the tutor.

ORDO II.

Decreaſed Volition.

GENUS I.

With decreaſed Actions of the Muſcles.

OUR muſcles become fatigued by long contraction, and ceaſe for a time to be excitable by the will; owing to exhauſtion of the ſenſorial power, which reſides in them. After a ſhort interval of relaxation the muſcle regains its power of voluntary contraction; which is probably occaſioned by a new ſupply of the ſpirit of animation. In weaker people theſe contractions ceaſe ſooner, and therefore recur more frequently, and are attended with ſhorter intervals of relaxation, as exemplified in the quickneſs of the pulſe in fevers with debility, and in the tremors of the hands of aged or feeble people.

After a common degree of exhauſtion of the ſenſorial power in a muſcle, it becomes again gradually reſtored by the reſt of the muſcle, and even accumulated in thoſe muſcles, which are moſt frequently uſed; as in thoſe which conſtitute the capillaries of the ſkin after having been rendered torpid by cold. But in thoſe muſcles, which are generally obedient to volition, as thoſe of locomotion, though their uſual quantity of ſenſorial power is reſtored by their quieſcence, or in ſleep (for ſleep affects

affects these parts of the system only), yet but little accumulation of it succeeds. And this want of accumulation of the sensorial power in these muscles, which are chiefly subservient to volition, explains to us one cause of their greater tendency to paralytic affection.

It must be observed, that those parts of the system, which have been for a time quiescent from want of stimulus, as the vessels of the skin, when exposed to cold, acquire an accumulation of sensorial power during their inactivity; but this does not happen at all, or in much less quantity, from their quiescence after great expenditure of sensorial power by a previous excessive stimulus, as after intoxication. In this case the muscles or organs of sense gradually acquire their natural quantity of sensorial power, as after sleep; but not an accumulation or superabundance of it. And by frequent repetitions of exhaustion by great stimulus, these vessels cease to acquire their whole natural quantity of sensorial power; as in the scirrhous stomach, and scirrhous liver, occasioned by the great and frequent stimulus of vinous spirit; which may properly be termed irritative paralysis of those parts of the system.

In the same manner in common palsies the inaction of the paralytic muscle seems not to be owing to defect of the stimulus of the will, but to exhaustion of sensorial power. Whence it

frequently follows great exertion, as in Sect. XXXIV. 1. 7. Thus ſome parts of the ſyſtem may ceaſe to obey the will, as in common paraſyſis; others may ceaſe to be obedient to ſenſation, as in the impotency of age; others to irritation, as in ſcirrhous viſcera; and others to aſſociation, as in impediment of ſpeech; yet though all theſe may become inexcitable, or dead, in reſpect to that kind of ſtimulus, which has previouſly exhauſted them, whether of volition, or ſenſation, or irritation, or aſſociation, they may ſtill in many caſes be excited by the others.

SPECIES.

1. *Laſſitudo.* Fatigue or wearineſs after much voluntary exertion. From the too great expenditure of ſenſorial power the muſcles are with difficulty brought again into voluntary contraction; and ſeem to require a greater quantity or energy of volition for this purpoſe. At the ſame time they ſtill remain obedient to the ſtimulus of agreeable ſenſation, as appears in tired dancers finding a renovation of their aptitude to motion on the acquiſition of an agreeable partner; or from a tired child riding on a gold-headed cane, as in Sect. XXXIV. 2. 6. Theſe muſcles are likewiſe ſtill obedient to the ſenſorial power of aſſociation, becauſe the motions when thus excited,

cited, are performed in their designed directions, and are not broken into variety of gesticulation, as in St. Vitus's dance.

A lassitude likewise frequently occurs with yawning at the beginning of ague-fits; where the production of sensorial power in the brain is less than its expenditure. For in this case the torpor may either originate in the brain, or the torpor of some distant parts of the system may by sympathy affect the brain, though in a less proportionate degree than the parts primarily affected.

2. *Vacillatio senilis.* Some elderly people acquire a see-saw motion of their bodies from one side to the other, as they sit, like the oscillation of a pendulum. By these motions the muscles, which preserve the perpendicularity of the body, are alternately quiescent, and exerted; and are thus less liable to fatigue or exhaustion. This therefore resembles the tremors of old people above mentioned, and not those spasmodic movements of the face or limbs, which are called tricks, described in Class IV. 3. 2. 2. which originate from excess of sensorial power, or from efforts to relieve disagreeable sensation, and are afterwards continued by habit.

3. *Tremor senilis.* Tremor of old age consists of a perpetual trembling of the hands, or of the

head, or of other muſcles, when they are exerted; and is erroneouſly called paralytic; and ſeems owing to the ſmall quantity of animal power reſiding in the muſcular fibres. Theſe tremors only exiſt when the affected muſcles are excited into action, as in lifting a glaſs to the mouth, or in writing, or in keeping the body upright; and ceaſe again, when no voluntary exertion is attempted, as in lying down. Hence theſe tremors evidently originate from the too quick exhauſtion of the leſſened quantity of the ſpirit of animation. So many people tremble from fear or anger, when too great a part of the ſenſorial power is exerted on the organs of ſenſe, ſo as to deprive the muſcles, which ſupport the body erect, of their due quantity.

4. *Brachiorum paralyſis.* A numbneſs of the arms is a frequent ſymptom in hydrops thoracis, as explained in Claſs I. 2. 3. 14. and in Sect. XXIX. 5. 2.; it alſo accompanies the aſthma dolorificum, Claſs III. 1. 1. 11. and is owing probably to the ſame cauſe in both. In the colica ſaturnina a paralyſis affects the wriſts, as appears on the patient extending his arm horizontally with the palm downwards, and is often attended with a tumor on the carpal or metacarpal bones. See Claſs IV. 2. 2. 10. and I. 2. 4. 8.

Mr. M——, a miner and well-ſinker, about three years ago, loſt the power of contracting

both his thumbs; the balls or muſcles of the thumbs are much emaciated, and remain paralytic. He aſcribes his diſeaſe to immerſing his hands too long in cold water in the execution of his buſineſs. He ſays his hands had frequently been much benumbed before, ſo that he could not without difficulty clench them; but that they recovered their motion, as ſoon as they began to glow, after he had dried and covered them.

In this caſe there exiſted two injurious circumſtances of different kinds; one the violent and continued action of the muſcles, which deſtroys by exhauſting the ſenſorial power; and the other, the application of cold, which deſtroys by defect of ſtimulus. The cold ſeems to have contributed to the paralyſis by its long application, as well as the continued exertion; but as during the torpor occaſioned by the expoſure to cold, if the degree of it be not ſo great as to extinguiſh life, the ſenſorial power becomes accumulated; there is reaſon to believe, that the expoſing a paralytic limb to the cold for a certain time, as by covering it with ſnow or iced water for a few minutes, and then covering it with warm flannel, and this frequently repeated, might, by accumulation of ſenſorial power, contribute to reſtore it to a ſtate of voluntary excitability. As this accumulation of ſenſorial power, and conſequent glow, ſeem, in the preſent caſe, ſeveral times to have contributed to reſtore the numbneſs or inability of thoſe

muſcles, which at length became paralytic. See Claſs I. 2. 3. 21.

M. M. Ether externally. Friction. Saline warm bath. Electricity. Mercurial ointment. See Claſs I. 2. 4. 8.

5. *Raucedo paralytica.* Paralytic hoarſeneſs conſiſts in the almoſt total loſs of voice, which ſometimes continues for months, or even years, and is occaſioned by inability or paralyſis of the recurrent nerves which ſerve the muſcles of vocality, by opening or cloſing the larynx. The voice generally returns ſuddenly, even ſo as to alarm the patient. A young lady, who had many months been affected with almoſt a total loſs of voice, and had in vain tried variety of advice, recovered her voice in an inſtant, on ſome alarm as ſhe was dancing at an aſſembly. Was this owing to a greater exertion of volition than uſual? like the dumb young man, the ſon of Crœſus, who is related to have cried out, when he ſaw his father's life endangered by the ſword of his enemy, and to have continued to ſpeak ever afterwards. Two young ladies in this complaint ſeemed to be cured by electric ſhocks paſſed through the larynx every day for a fortnight. See Raucedo catarrhalis, Claſs II. 1 3. 5.

M. M. An emetic. Electric ſhocks. Muſtard-ſeed, a large ſpoonful ſwallowed whole, or a little bruiſed, every morning Valerian. Burnt ſponge. Bliſters on each ſide of the larynx. Sea-bathing.

bathing. A gargle of decoction of ſeneca. Friction. Frequent endeavours to ſhout and ſing.

6. *Veſicæ urinariæ paralyſis.* Paralyſis of the bladder is frequently a ſymptom in irritative fever; in this caſe the patient makes no water for a day or two; and the tumor of the bladder diſtended with urine may be ſeen by the ſhape of the abdomen, as if girt by a cord below the navel, or diſtinguiſhed by the hand. Many patients in this ſituation make no complaint, and ſuffer great injury by the inattention of their attendants; the water muſt be drawn off once or twice a day by means of a catheter, and the region of the bladder gently preſſed by the hand, whilſt the patient is kept in a ſitting or erect poſture. See Claſs II. 2. 2. 6.

M. M. Bark. Wine. Opium, a quarter of a grain every ſix hours. Balſam of copaiva or of Peru. Tincture of cantharides 20 drops twice a day, or repeated ſmall bliſters.

An inability to empty the bladder frequently occurs to elderly men, and is often fatal. This ſometimes ariſes from their having too long been reſtrained from making water from accidental confinement in public ſociety, or otherwiſe; whence the bladder has become ſo far diſtended as to become paralytic; and not only this, but the neck of the bladder has become contracted ſo as to reſiſt the introduction of the catheter. In this

this deplorable caſe it has frequently happened, that the forcible efforts to introduce the catheter have perforated the urethra; and the inſtrument has been ſuppoſed to paſs into the bladder, when it has only paſſed into the cellular membrane along the ſide of it; of which I believe I have ſeen two or three inſtances; and afterwards the part has become ſo much inflamed as to render the introduction of the catheter into the bladder impracticable.

In this ſituation the patients are in imminent danger, and ſome have adviſed a trocar to be introduced into the bladder from the rectum; which I believe is generally followed by an incurable ulcer. One patient, whom I ſaw in this ſituation, began to make a ſpoonful of water after ſix or ſeven days, and gradually in a few days emptied his bladder to about half its ſize, and recovered; but I believe he never afterwards was able completely to evacuate it.

In this ſituation I lately adviſed about two pounds of crude quickſilver to be poured down a glaſs tube, which was part of a barometer tube, drawn leſs at one end, and about two feet long, into the urethra, as the patient lay on his back; which I had previouſly performed upon a horſe; this eaſily paſſed, as was ſuppoſed, into the bladder; on ſtanding erect it did not return, but on kneeling down, and lying horizontally on his hands, the mercury readily returned; and on this account it was believed to have paſſed into the

the bladder, as it ſo eaſily returned, when the neck of the bladder was lower than the fundus of it. But nevertheleſs as no urine followed the mercury, though the bladder was violently diſtended, I was led to believe, that the urethra had been perforated by the previous efforts to introduce a catheter and bougee; and that the mercury had paſſed on the outſide of the bladder into the cellular membrane.

As the urethra is ſo liable to be perforated by the forcible efforts to introduce the catheter, when the bladder is violently diſtended in this deplorable diſeaſe, I ſhould ſtrongly recommend the injection of a pound or two of crude mercury into the urethra to open by its weight the neck of the bladder previous to any violent or very frequent eſſays with a catheter whether of metal or of elaſtic reſin.

7. *Recti paralyſis.* Palſy of the rectum. The rectum inteſtinum, like the urinary bladder in the preceding article, poſſeſſes voluntary power of motion; though theſe volitions are at times uncontrollable by the will, when the acrimony of the contained feces, or their bulk, ſtimulates it to a greater degree. Hence it happens, that this part is liable to loſe its voluntary power by paralyſis, but is ſtill liable to be ſtimulated into action by the contained feces. This frequently occurs in fevers, and is a bad ſign as a ſymptom of general

general debility; and it is the ſenſibility of the muſcular fibres of this and of the urinary bladder remaining, after the voluntarity has ceaſed, which occaſions theſe two reſervoirs ſo ſoon to regain, as the fever ceaſes, their obedience to volition; becauſe the paralyſis is thus ſhewn to be leſs complete in thoſe caſes than in common hemiplegia; as in the latter the ſenſe of touch, though perhaps not the ſenſe of pain, is generally deſtroyed in the paralytic limb.

M.M. A ſponge introduced within the ſphincter ani to prevent the conſtant diſcharge, which ſhould have a ſtring put through it, by which it may be retracted.

8. *Pareſis voluntaria.* Indolence; or inaptitude to voluntary action. This debility of the exertion of voluntary efforts prevents the accompliſhment of all great events in life. It often originates from a miſtaken education, in which pleaſure or flattery is made the immediate motive of action, and not future advantage; or what is termed duty. This obſervation is of great value to thoſe, who attend to the education of their own children. I have ſeen one or two young married ladies of fortune, who perpetually became uneaſy, and believed themſelves ill, a week after their arrival in the country, and continued ſo uniformly during their ſtay; yet on their return to London or Bath immediately loſt all their complaints,

complaints, and this repeatedly; which I was led to aſcribe to their being in their infancy ſurrounded with menial attendants, who had flattered them into the exertions they then uſed. And that in their riper years, they became torpid for want of this ſtimulus, and could not amuſe themſelves by any voluntary employment; but required ever after, either to be amuſed by other people, or to be flattered into activity. This I ſuppoſe, in the other ſex, to have ſupplied one ſource of ennui and ſuicide. See Claſs III. 1. 2. 11.

9. *Catalepſis* is ſometimes uſed for fixed ſpaſmodic contractions or tetanus, as deſcribed in Sect. XXXIV. 1. 5. and in Claſs III. 1. 1. 13. but is properly ſimply an inaptitude to muſcular motion, the limbs remaining in any attitude in which they are placed. One patient whom I ſaw in this ſituation, had taken much mercury, and appeared univerſally torpid. He ſat in a chair in any poſture he was put, and held a glaſs to his mouth for many minutes without attempting to drink, or withdrawing his hand. He never ſpoke, and it was at firſt neceſſary to compel him to drink broth; he recovered in a few weeks without relapſe.

10. *Hemiplegia.* Palſy of one ſide conſiſts in the total diſobedience of the affected muſcles to the

the power of volition. As the voluntary motions are not perpetually exerted, there is little ſenſorial power accumulated during their quieſcence, whence they are leſs liable to recover from torpor, and are thus more frequently left paralytic, or diſobedient to the power of volition, though they are ſometimes ſtill alive to painful ſenſation, as to the prick of a pin, and to heat; alſo to irritation, as in ſtretching and yawning; or to electric ſhocks. Where the paralyſis is complete the patient ſeems gradually to learn to uſe his limbs over again by repeated efforts, as in infancy; and, as time is required for this purpoſe, it becomes difficult to know, whether the cure is owing to the effect of medicines, or to the repeated efforts of the voluntary power.

The diſpute, whether the nerves decuſſate or croſs each other before they leave the cavities of the ſkull or ſpine, ſeems to be decided in the affirmative by comparative anatomy; as the optic nerves of ſome fiſh have been ſhewn evidently to croſs each other; as ſeen by Haller, Elem. Phyſiol. t. v. p. 349. Hence the application of bliſters or of ether, or of warm fomentations, ſhould be on the ſide of the head oppoſite to that of the affected muſcles. This ſubject ſhould nevertheleſs be nicely determined, before any one ſhould trepan for the hydrocephalus internus, when the diſeaſe is ſhewn to exiſt only on one ſide of the brain, by a ſquinting affecting but one eye; as

as propofed in Clafs I. 2. 5. 4. Dr. Sommering has fhewn, that a true decuffation of the optic nerves in the human fubject actually exifts, Elem. of Phyfiology by Blumenbach, tranflated by C. Caldwell, Philadelphia. This further appears probable from the oblique direction and infertion of each optic nerve, into the fide of the eye next to the nofe, in a direct line from the oppofite fide of the brain.

The vomiting, which generally attends the attack of hemiplegia, is mentioned in Sect. XX. 8. and is fimilar to that attending vertigo in feafickneefs, and at the commencement of fome fevers. Black ftools fometimes attend the commencement of hemiplegia, which is probably an effufion of blood from the biliary duct, where the liver is previoufly affected; or fome blood may be derived to the inteftines by its efcaping from the vena cava into the receptacle of chyle during the diftrefs of the paralytic attack; and may be conveyed from thence into the inteftines by the retrograde motions of the lacteals; as probably fometimes happens in diabetes. See Sect. XXVII. 2. Palfy of one fide of the face is mentioned in Clafs II. 1. 4. 6. Paralyfis of the lacteals, of the liver, and of the veins, which are defcribed in Sect. XXVIII. XXX. and XXVII. do not belong to this clafs, as they are not difeafes of voluntary motions.

M. M. The electric fparks and fhocks, if ufed

early

early in the diſeaſe, are frequently of ſervice. A purge of aloes, or calomel. A vomit. Bliſter. Saline draughts. Then the bark. Mercurial ointment or ſublimate, where the liver is evidently diſeaſed; or where the gutta roſea has previouſly exiſted. Sudden alarm. Frequent voluntary efforts. Externally ether. Volatile alcali. Fomentation on the head. Friction. When children, who have ſuffered a hemiplegia, begin to uſe the affected arm, the other hand ſhould be tied up for half an hour three or four times a day; which obliges them at their play to uſe more frequent voluntary efforts with the diſeaſed limb, and thus ſooner to reſtore the diſſevered aſſociations of motion.

In hemiplegia, as well as toward the end of ſome fevers with great debility, the parts about the loins are liable to mortify by the preſſure of a continued recumbency upon them, and in part by the friction of thoſe parts againſt the ſheet, as the patient ſlides down again after being frequently raiſed higher in his bed, to prevent which a pillow ſhould be put beneath the underſheet half way down the bed, as in Claſs II. 1. 2. 4. A ſolution of ſugar of lead, or white lead in fine powder, or a cerate of lapis calaminaris contributes to heal or to prevent theſe excoriations. But the moſt efficacious preventive conſiſts in the patient's wearing a pair of linen drawers; by which means, when he ſlides down in his bed,

bed, the friction will be between the sheet and his drawers, not between the sheet and his skin; and this greater friction will in general prevent his sliding down in bed, when his head and shoulders are raised on more pillows, which will on this account also contribute much to his comfort; this is also worthy the attention of those dropsical patients, who are necessitated to lie with the head raised high in bed.

When these patients have any difficulty of swallowing, they should be raised up when any fluid is put into the mouth, lest it should suffocate them. See Apoplexia, No. 16. Nor should young children be fed as they lie on their backs, as they are then obliged to swallow as much as the nurse pleases; like one of the punishments formerly used in the inquisition, where the delinquent was made to swallow many quarts of water, as he was chained down on his back, and was suffocated by it.

In paralysis of the wrists from lead, Mr. Clutterbuck has lately published some successful cases of the use of mercurial ointment. See Colica Saturnina, I. 2. 4. 8. See Class III. 2. 1. 4.

Dr. J. Alderson has lately much recommended the leaves of rhus toxicodendron (sumach), from i. gr. to iv. of the dried powder to be taken three or four times a day. Essay on Rhus Toxic. Johnson, London, 1793. But it is difficult to know what medicine is of service, as the move-

ments of the muſcles muſt again be learned, as in infancy, by frequent efforts.

11. *Paraplegia.* A palſy of the lower half of the body divided horizontally. Animals may be conceived to have double bodies, one half in general reſembling ſo exactly the other, and being ſupplied with ſeparate ſets of nerves; this gives riſe to hemiplegia, or palſy of one half of the body divided vertically; but the paraplegia, or palſy of the lower parts of the ſyſtem, depends on an injury of the ſpinal marrow, or that part of the brain which is contained in the vertebræ of the back; by which all the nerves ſituated below the injured part are deprived of their nutriment, or precluded from doing their proper offices; and the muſcles, to which they are derived, are in conſequence diſobedient to the power of volition.

This ſometimes occurs from an external injury, as a fall from an eminence; of which I ſaw a deplorable inſtance, where the bladder and rectum, as well as the lower limbs, were deprived of ſo much of their powers of motion, as depended on volition or ſenſation; but I ſuppoſe not of that part of it, which depends on irritation. In the ſame manner as the voluntary muſcles in hemiplegia are ſometimes brought into action by irritation, as in ſtretching or pandiculation, deſcribed in Sect. VII. 1. 3.

But

But the moſt frequent cauſe of paraplegia is from a protuberance of one of the ſpinal vertebræ; which is owing to the innutrition or ſoftneſs of bones, deſcribed in Claſs I. 2. 2. 17. The cure of this deplorable diſeaſe is frequently effected by the ſtimulus of an iſſue placed on each ſide of the prominent ſpine, as firſt publiſhed by Mr. Pott. The other means recommended in ſoftneſs of bones ſhould alſo be attended to; both in reſpect to the internal medicines, and to the mechanical methods of ſupporting, or extending the ſpine; which laſt, however, in this caſe requires particular caution.

12. *Somnus.* In ſleep all voluntary power is ſuſpended, ſee Sect. XVIII. An unuſual quantity of ſleep is often produced by weakneſs. In this caſe ſmall doſes of opium, wine, and bark, may be given with advantage. For the periods of ſleep, ſee Claſs IV. 2. 4. 1.

The ſubſequent ingenious obſervations on the frequency of the pulſe, which ſometimes occurs in ſleep, are copied from a letter of Dr. Currie of Liverpool to the author.

"Though reſt in general perhaps renders the healthy pulſe ſlower, yet under certain circumſtances the contrary is the truth. A full meal without wine or other ſtrong liquor does not increaſe the frequency of my pulſe, while I ſit upright, and have my attention engaged. But if I

take a recumbent posture after eating, my pulse becomes more frequent, especially if my mind be vacant, and I become drowsy; and, if I slumber, this increased frequency is more considerable with heat and flushing.

"This I apprehend to be a general truth. The observation may be frequently made upon children; and the restless and feverish nights experienced by many people after a full supper are, I believe, owing to this cause. The supper occasions no inconvenience, whilst the person is upright and awake; but, when he lies down and begins to sleep, especially if he does not perspire, the symptoms above mentioned occur. Which may be thus explained in part from your principles. When the power of volition is abolished, the other sensorial actions are increased. In ordinary sleep this does not occasion increased frequency of the pulse; but where sleep takes place during the process of digestion, the digestion itself goes on with increased rapidity. Heat is excited in the system faster than it is expended; and operating on the sensitive actions, it carries them beyond the limitation of pleasure, producing, as is common in such cases, increased frequency of pulse.

"It is to be observed, that in speaking of the heat generated under these circumstances, I do not allude to any chemical evolution of heat from the food in the process of digestion. I doubt

doubt if this takes place to any considerable degree, for I do not observe that the parts incumbent on the stomach are increased in heat during the most hurried digestion. It is on some parts of the surface, but more particularly on the extremities of the body, that the increased heat excited by digestion appears, and the heat thus produced arises, as it should seem, from the sympathy between the stomach and the vessels of the skin. The parts most affected are the palms of the hands, and the soles of the feet. Even there the thermometer seldom rises above 97 or 98 degrees, a temperature not higher than that of the trunk of the body; but three or four degrees higher than the common temperature of these parts, and therefore producing an uneasy sensation of heat, a sensation increased by the great sensibility of the parts affected.

"That the increased heat excited by digestion in sleep is the cause of the accompanying fever, seems to be confirmed by observing, that if an increased expenditure of heat accompanies the increased generation of it (as when perspiration on the extremities or surface attends this kind of sleep) the frequent pulse and flushed countenance do not occur, as I know by experiment. If, during the feverish sleep already mentioned, I am awakened, and my attention engaged powerfully, my pulse becomes almost immediately slower, and the fever gradually subsides."

From theſe obſervations of Dr. Currie it appears, that, while in common ſleep the actions of the heart, arteries, and capillaries, are ſtrengthened by the accumulation of ſenſorial power during the ſuſpenſion of voluntary action, and the pulſe in conſequence becomes fuller and ſlower; in the feveriſh ſleep above deſcribed the actions of the heart, arteries, and capillaries, are quickened as well as ſtrengthened by their conſent with the increaſed actions of the ſtomach, as well as by the ſtimulus of the new chyle introduced into the circulation. For the ſtomach, and all other parts of the ſyſtem, being more ſenſible and more irritable during ſleep, Sect. XVIII. 15. and probably more ready to act from aſſociation, are now exerted with greater velocity as well as ſtrength, conſtituting a temporary fever of the ſenſitive irritated kind, reſembling the fever excited by wine in the beginning of intoxication; or in ſome people by a full meal in their waking hours. Sect. XXXV. 1.

On waking, this increaſed ſenſibility and irritability of the ſyſtem ceaſes by the renewed exertions of volition; in the ſame manner as more violent exertions of volition deſtroy greater pains; and the pulſe in conſequence ſubſides along with the increaſe of heat; if more violent efforts of volition are exerted, the ſyſtem becomes ſtill leſs affected by ſenſation or irritation. Hence the fever and vertigo of intoxication are leſſened by

by intenſe thinking, Sect. XXI. 8; and infane people are known to bear the pain of cold and hunger better than others, Sect. XXXIV. 2. 5; and laſtly, if greater voluntary efforts exiſt, as in violent anger or violent exerciſe, the whole ſyſtem is thrown into more energetic action, and a voluntary fever is induced, as appear sby the red ſkin, quickened pulſe, and increaſe of heat; whence dropſies and fevers with debility are not unfrequently removed by inſanity.

Hence the exertion of the voluntary power in its natural degree diminiſhes the increaſed ſenſibility, and irritability, and probably the increaſed aſſociability, which occur during ſleep; and thus reduces the frequency of the pulſe in the feveriſh ſleep after a full meal. In its more powerful ſtate of exertion, it diminiſhes or deſtroys ſenſations and irritations, which are ſtronger than natural, as in intoxication, or which precede convulſions, or inſanity. In its ſtill more powerful degree, the ſuperabundance of this ſenſorial power actuates and invigorates the whole moving ſyſtem, giving ſtrength and frequency to the pulſe, and an univerſal glow both of colour and of heat, as in violent anger, or outrageous inſanities.

If, in the feveriſh ſleep above deſcribed, the ſkin becomes cooled by the evaporation of much perſpirable matter, or by the application of cooler air, or thinner clothes, the actions of the cuta-

neous capillaries are leſſened by defect of the ſtimulus of heat, which counteracts the increaſe of ſenſibility during ſleep, and the pulſations of the heart and arteries become ſlower from the leſſened ſtimulus of the particles of blood thus cooled in the cutaneous and pulmonary veſſels. Hence the admiſſion of cold air, or ablution with ſubtepid or with cold water, in fevers with hot ſkin, whether they be attended with arterial ſtrength, or arterial debility, renders the pulſe ſlower; in the former caſe by diminiſhing the ſtimulus of the blood, and in the latter by leſſening the expenditure of ſenſorial power. See Suppl. I. 8. and 15.

13. *Incubus.* The night-mare is an imperfect ſleep, where the deſire of locomotion is vehement, but the muſcles do not obey the will; it is attended with great uneaſineſs, a ſenſe of ſuffocation, and frequently with fear. It is cauſed by violent fatigue, or drunkenneſs, or indigeſtible food, or lying on the back, or perhaps from many other kinds of uneaſineſs in our ſleep, which may originate either from the body or mind.

Now as the action of reſpiration is partly voluntary, this complaint may be owing to the irritability of the ſyſtem being too ſmall to carry on the circulation of the blood through the lungs during ſleep, when the voluntary power is ſuſpended. Whence the blood may accumulate in them, and a painful oppreſſion ſupervene; as in ſome

ſome hæmorrhages of the lungs, which occur during ſleep; and in patients much debilitated by fevers. See Somnus interruptus, Claſs I. 2. 1. 3. and I. 2. 1. 9.

Great fatigue with a full ſupper and much wine, I have been well informed by one patient, always produced this diſeaſe in himſelf to a great degree. Now the general irritability of the ſyſtem is much decreaſed by fatigue, as it exhauſts the ſenſorial power; and ſecondly, too much wine and ſtimulating food will again diminiſh the irritability of ſome parts of the ſyſtem; by employing a part of the ſenſorial power, which is already too ſmall, in digeſting a great quantity of aliment; and in increaſing the motions of the organs of ſenſe in conſequence of ſome degree of intoxication, whence difficulty of breathing may occur from the inirritability of the lungs, as in Claſs I. 2. 1. 3.

This explains an apparent paradox, why people who are feeble, digeſt their dinners beſt, if they lie down and ſleep, as moſt animals do, when their ſtomachs are full. Yet many weak people ſleep very uneaſily after a large ſupper. If the debility of the patient be not very great, and the dinner he has taken, be moderate, the ſuſpenſion of voluntary action during ſleep prevents the expenditure of ſo much ſenſorial power, which may be employed on the actions of the ſtomach, and thus facilitate the digeſtive proceſs. If the pa-

tient be further exhauſted as in the evening, or his debility greater, and ſleep enſues after a copious or ſtimulating ſupper, ſo much ſenſorial power will be exerted on the actions of the ſtomach for digeſtion, that the circulation of the blood through the lungs will be impeded from the diminiſhed irritability to external ſtimuli, and the abſence of volition, as in the incubus, and ſomnus interruptus.

M. M. To ſleep on a hard bed with the head raiſed. Moderate ſupper. The bark. By ſleeping on a harder bed the patient will turn himſelf more frequently, and not be liable to ſleep too profoundly, or lie too long in one poſture. To be awakened frequently by an alarm clock.

14. *Lethargus.* The lethargy is a ſlighter apoplexy. It is ſuppoſed to originate from univerſal preſſure on the brain, and is ſaid to be produced by compreſſing the ſpinal marrow, where there is a deficiency of the bone in the ſpina bifida. See Sect. XVIII. 20. Whereas in the hydrocephalus there is only a partial preſſure of the brain; and probably in nervous fevers with ſtupor the preſſure on the brain may affect only the nerves of the ſenſes, which lie within the ſkull, and not thoſe nerves of the medulla oblongata, which principally contribute to move the heart and arteries; whence in the lethargic or apoplectic ſtupor the pulſe is ſlow as in ſleep, whereas in

nervous

nervous fever the pulſe is very quick and feeble, and generally ſo in hydrocephalus.

In caſes of obſtructed kidneys, whether owing to the tubuli uriniſeri being totally obſtructed by calculous matter, or by their paralyſis, a kind of drowſineſs or lethargy comes on about the eighth or ninth day, and the patient gradually ſinks. See Claſs I. 1. 3. 9.

15. *Syncope epileptica*, is a temporary apoplexy, the pulſe continuing in its natural ſtate, and the voluntary power ſuſpended. This terminates the paroxyſms of epilepſy.

When the animal power is much exhauſted by the preceding convulſions, ſo that the motions from ſenſation as well as thoſe from volition are ſuſpended; in a quarter or half an hour the ſenſorial power becomes reſtored, and if no pain, or irritation producing pain, recurs, the fit of epilepſy ceaſes; if the pain recurs, or the irritation, which uſed to produce it, a new fit of convulſion takes place, and is ſucceeded again by a ſyncope. See Epilepſy, Claſs III. 1. 1. 7.

16. *Apoplexia*. Apoplexy may be termed an univerſal palſy, or a permanent ſleep. In which, where the pulſe is weak, copious bleeding muſt be injurious; as is well obſerved by Dr. Heberden, Tranſ. of the College.

Mr. ——, about 70 years of age, had an apoplectic

plectic ſeizure. His pulſe was ſtrong and full. One of the temporal arteries was opened, and about ten ounces of blood ſuddenly taken from it. He ſeemed to receive no benefit from this operation; but gradually ſunk, and lived but a day or two.

If apoplexy ariſes from the preſſure of blood extravaſated on the brain, one moderate veneſection may be of ſervice to prevent the further effuſion of blood; but copious veneſection muſt be injurious by weakening the patient; ſince the effuſed blood muſt have time, as in common vibices or bruiſes, to undergo a chemico-animal proceſs, ſo to change its nature as to fit it for abſorption; which may take two or three weeks, which time a patient weakened by repeated veneſection or arteriotomy may not ſurvive.

Mrs. ———, about 40 years old, had an apoplectic ſeizure after great exertion from fear; ſhe had lain about 24 hours without ſpeech, or having ſwallowed any liquid. She was then forcibly raiſed in bed, and a ſpoonful of ſolution of aloes in wine put into her mouth, and the end of the ſpoon withdrawn, that ſhe might more eaſily ſwallow the liquid.—This was done every hour, with broth, and wine and water intervening, till evacuations were procured; which with other means had good effect, and ſhe recovered, except that a conſiderable degree of hemiplegia remained, and ſome imperfection of her ſpeech.

Many people, who have taken ſo much vinous

ſpirit

ſpirit as to acquire the temporary apoplexy of intoxication, and are not improperly ſaid to be dead-drunk, have died after copious veneſection, I ſuppoſe in conſequence of it. I once ſaw at a public meeting two gentlemen in the drunken apoplexy; they were totally inſenſible with low pulſe, on this account they were directed not to loſe blood, but to be laid on a bed with their heads high, and to be turned every half hour; as ſoon as they could ſwallow, warm tea was given them, which evacuated their ſtomachs, and they gradually recovered, as people do from leſs degrees of intoxication.

M. M. Cupping on the occiput. Veneſection once in moderate quantity. Warm fomentations long continued and frequently repeated on the ſhaved head. Solution of aloes. Clyſters with ſolution of aloes and oil of amber. A bliſter on the ſpine. An emetic. Afterwards the bark, and ſmall doſes of chalybeates. Small electric ſhocks through the head. Errhines. If ſmall doſes of opium? mercurial ointment rubbed on the head or neck?

Where there is a difficulty of ſwallowing in apoplectic or paralytic patients, or in thoſe near death in fevers, or other diſeaſes, no fluid ſhould be put into their mouths as they lie upon their backs, leſt it ſhould choke them; but they ſhould be raiſed and ſupported upright in their beds, and ſtimulated by ſtrong light, and ſpoken

to

to in a louder voice, defiring them to fwallow, as the fluid is put into the mouth, and the fpoon fhould be immediately withdrawn, that they may clofe their mouths. Hence if they cannot fwallow, it will flow out of their mouths, and not endanger fuffocating them. See Hemiplegia, Spec. 10, of this genus.

17. *Mors a frigore.* Death from cold. The unfortunate travellers, who almoft every winter perifh in the fnow, are much exhaufted by their efforts to proceed on their journey, as well as benumbed by cold. And as much greater exercife can be borne without fatigue in cold weather than in warm; becaufe the exceffive motions of the cutaneous veffels are thus prevented, and the confequent wafte of fenforial power; it may be inferred, that the fatigued traveller becomes paralytic from violent exertion as well as by the application of cold.

Great degrees of cold affect the motions of thofe veffels moft, which have been generally excited into action by irritation; for when the feet are much benumbed by cold, and painful, and at the fame time almoft infenfible to the touch of external objects, the voluntary mufcles retain their motions, and we continue to walk on; the fame happens to the fingers of children in throwing fnow-balls, the voluntary motions of

of the muſcles continue, though thoſe of the cutaneous veſſels are benumbed into inactivity.

Mr. Thompſon, an elderly gentleman of Shrewſbury, was ſeized with hemiplegia in the cold bath; which I ſuppoſe might be owing to ſome great energy of exertion, as much as to the coldneſs of the water. As in the inſtance given of Mr. Nairn, who, by the exertion to ſave his relation, periſhed himſelf. See Sect. XXXIV. 1. 7.

Whence I conclude, that, though heat is a fluid neceſſary to muſcular motion, both perhaps by its ſtimulus, and by its keeping the minute component parts of the ultimate fibrils of the muſcles or organs of ſenſe at a proper diſtance from each other; yet paralyſis, properly ſo called, is the conſequence of exhauſtion of ſenſorial power by exertion. And that the accumulations of it during the torpor of the cutaneous veſſels by expoſure to cold, or of ſome internal viſcus in the cold fits of agues, are frequently inſtrumental in recovering the uſe of paralytic limbs, or of the motions of other paralytic parts of the ſyſtem. See Spec. 4. of this genus.

Animal bodies reſiſt the power of cold probably by their exertions in conſequence of the pain of cold, ſee Botan. Gard. V. 1. additional note xii. But if theſe increaſed exertions be too violent, ſo as to exhauſt the ſenſorial power in producing unneceſſary motions, the animal will probably ſooner periſh. Thus a moderate quantity of wine

wine or ſpirit repeated at proper intervals of time might be of ſervice to thoſe, who are long expoſed to exceſſive cold, both by increaſing the action of the capillary veſſels, and thus producing heat, and perhaps by increaſing in ſome degree the ſecretion of ſenſorial power in the brain. But the contrary muſt happen when taken immoderately, and not at due intervals. A well-atteſted hiſtory was once related to me of two men, who ſet out on foot to travel in the ſnow, one of whom drank two or three glaſſes of brandy before they began their journey, the other contented himſelf with his uſual diet and potation; the former of whom periſhed in ſpite of any aſſiſtance his companion could afford him; and the other performed his journey with ſafety. In this caſe the ſenſorial power was exhauſted by the unneceſſary motions of incipient intoxication by the ſtimulus of the brandy, as well as by the exertions of walking; which ſo weakened the dram-drinker, that the cold ſooner deſtroyed him; that is, he had not power to produce ſufficient muſcular or arterial action, and in conſequence ſufficient heat, to ſupply the great expenditure of it. Hence the capillaries of the ſkin firſt ceaſed to act, and became pale and empty; next thoſe which are immediately aſſociated with them, as the extremities of the pulmonary artery, as happens on going into the cold bath. By the continued inaction of theſe parts of the

vaſcular

vascular system the blood becomes accumulated in the internal arteries, and the brain is supposed to be affected by its compression; because these patients are said to sleep, or to become apoplectic, before they die. I overtook a fishman asleep on his panniers on a very cold frosty night, but on waking him he did not appear to be in any degree of stupor. See Class I. 2. 2. 1.

When travellers are benighted in deep snow, they might frequently be saved by covering themselves in it, except a small aperture for air; in which situation the lives of hares, sheep, and other animals, are so often preserved. The snow, both in respect to its component parts, and to the air contained in its pores, is a bad conductor of heat, and will therefore well keep out the external cold; and as the water, when part of it dissolves, is attracted into the pores of the remainder of it, the situation of an animal beneath it is perfectly dry; and, if he is in contact with the earth, he is in a degree of heat between 48, the medium heat of the earth, and 32, the freezing point; that is, in 40 degrees of heat, in which a man thus covered will be as warm as in bed. See Botan. Garden, V. II. notes on Anemone, Barometz, and Muscus. If these facts were more generally understood, it might annually save the lives of many.

After any part of the vascular system of the body has been long exposed to cold, the sensorial

rial power is ſo much accumulated in it, that on coming into a warm room the pain of hotach is produced, and inflammation, and conſequent mortification, owing to the great exertion of thoſe veſſels, when again expoſed to a moderate degree of warmth. See Sect. XII. 5. Whence the propriety of applying but very low degrees of heat to limbs benumbed with cold at firſt, as of ſnow in its ſtate of diſſolving, which is at 32 degrees of heat, or of very cold water. A French writer has obſerved, that if frozen apples be thawed gradually by covering them with thawing ſnow, or immerſing them in very cold water, they do not loſe their taſte; if this fact was well aſcertained, it might teach us how to preſerve other ripe fruits in ice-houſes for winter conſumption. See Suppl. I. 14. 3.

The pain of cold is probably owing to the accumulation of the ſenſorial power of irritation. As the ſkins of thoſe, who have been conſtantly ſtimulated into great action by external heat, muſt ſoon poſſeſs an accumulation of that ſenſorial power, when the ſtimulus of heat is withdrawn. See tædium vitæ from accumulation of the ſenſorial power of volition. III. 1. 2. 11.

ORDO

ORDO II.

Decreaſed Volition.

GENUS II.

With decreaſed Actions of the Organs of Senſe.

SPECIES.

1. *Recollectionis jactura.* Loſs of recollection. This is the defect of memory in old people, who forget the actions of yeſterday, being incapable of voluntary recollection, and yet remember thoſe of their youth, which by frequent repetition are introduced by aſſociation or ſuggeſtion. This is properly the paralyſis of the mind; the organs of ſenſe do not obey the voluntary power; that is, our ideas cannot be recollected, or acted over again by the will.

After an apoplectic attack the patients, on beginning to recover, find themſelves moſt at a loſs in recollecting proper names of perſons or places; as thoſe words have not been ſo frequently aſſociated with the ideas they ſtand for, as the common words of a language. Mr. ——, a man of ſtrong mind, of a ſhort-necked family, many of whom had ſuffered by apoplexy, after an apoplectic fit, on his recovering the uſe of ſpeech, after repeated trials to remember the

name of a perſon or place, applauded himſelf, when he ſucceeded, with ſuch a childiſh ſmile on the partial return of his ſagacity, as very much affected me.—Not long, alas! to return; for another attack in a few weeks deſtroyed the whole. See Claſs IV. 2. 3. 8.

I ſaw a child after the ſmall-pox, which was left in this ſituation; it was lively, active, and even vigorous; but ſhewed that kind of ſurpriſe, which novelty excites, at every object it viewed; and that as often as it viewed it. I never heard the termination of the caſe.

2. *Stultitia voluntaria.* Voluntary folly. The abſence of voluntary power and conſequent incapacity to compare the ideas of preſent and future good. Brute animals may be ſaid to be in this ſituation, as they are in general excited into action only by their preſent painful or pleaſurable ſenſations. Hence though they are liable to ſurpriſe, when their paſſing trains of ideas are diſſevered by violent ſtimuli; yet are they not affected with wonder or aſtoniſhment at the novelty of objects; as they poſſeſs but in a very inferior degree, that voluntary power of comparing the preſent ideas with thoſe previouſly acquired, which diſtinguiſhes mankind; and is termed analogical reaſoning, when deliberatively exerted; and intuitive analogy, when uſed without our attention to it, and which always preſerves our hourly

trains

trains of ideas consistent with truth and nature. See Sect. XVII. 3. 7.

3. *Ratiocinatio verbosa.* Verbal reasoning. This arises from the feeble or inaccurate exertions of the faculty of volition in the act of recalling the ideas of things, and thus mistaking the ideas of words for them. One great imperfection of language consists in the use of what Mr. Horne Tooke calls general terms, as mentioned in Sect. XV. 1. 5. and Sect. XVI. 17. of this work, and which Mr. Locke supposed to express abstracted or general ideas, such as the word castle or army, which in common conversation includes any part or property of those complex things, and is thus liable to mislead inaccurate thinkers. Thus it was said last night, "That horse strikes fire as he passes along the pavement." And it was added jocularly, "that his feet must be as hard as iron," which mistake might arise from the general term, horse, including in common conversation both every part of the animal and his accoutrements.

A second source of false reasoning may arise from the same word having two significations totally different from each other; which may mislead those who reason from ideas of words instead of ideas of things. These are generally esteemed witticisms, and are called puns or quibbles; as the jocular syllogism on the word spirit.

"Brandy is a ſpirit; the Devil is a ſpirit; therefore brandy is the devil."

A third ſource of falſe reaſoning is derived from the two-fold meaning of ſome ſentences, or phraſes in all languages; this is alſo uſed deſignedly in jocular compoſitions, and conſtitutes the wit of ſome comedies. An old miller riding on his ſack of flour was accoſted by two young Cantabs, who rode on each ſide of him, with "Gentlemen of your profeſſion have ſometimes a doubtful character—pray, miller, do you think yourſelf more knave or fool?" the witty miller anſwered, looking firſt at one of them and then at the other, "I think myſelf at preſent between both." This double entendre of a ſentence was uſed by the prieſts of the ancient oracles to deceive the inquirer into future events. As that of

Aio te, Æacide, Romanos vincere poſſe.

I ſay, that you, Æacides, the Romans ſhall conquer.

There is a fourth mode of verboſe ratiocination, which conſiſts in the concluſion of the ſyllogiſm containing an imaginary, but not even a verbal analogy to the preceding propoſitions. Thus a ruſtic devotee ſaid to his prieſt, "I have often wondered, why God Almighty called the firſt man Adam?" "Don't you know," replied the teacher, "that A is the firſt letter of the al-

"phabet?"

phabet?" "Aye, ſo it is," anſwered the contented inquirer.

Another kind of falſe reaſoning is called by logicians a logical vice; and another kind ariſes from the firſt propoſition being untrue in reſpect to its exiſtence: but as all theſe, and perhaps many other ſources of falſe reaſonings, may be reſolved into the miſtaken uſe of ideas of words, or general terms, inſtead of ideas of the things, or parts of things, which they ought to ſuggeſt; they belong properly to this article of ratiocinatio verboſa: while the rare faculty of reaſoning without words by comparing ideas of things, as in the invention of new machines, and other new diſcoveries, diſtinguiſhes the philoſopher from the ſophiſt.

M. M. Children ſhould be permitted to uſe their hands early in their infancy, and ſhould be ſupplied with pencils, pens, and various tools; by which they will acquire accurate ideas of external things by the organ of touch, at the ſame time that they acquire words; and will thence be leſs liable to be ſeriouſly deceived by general terms, or by the double meanings of words, or of ſentences, or laſtly by falſe propoſitions or inconcluſive deductions; and will thus be enabled to compare the analogies of things, and to think without words; the faculty, which conſtitutes genius, and which ſo few poſſeſs!

4. *Credulitas.* Credulity. Life is ſhort, opportunities of knowledge rare; our ſenſes are fallacious, our reaſonings uncertain, man therefore ſtruggles with perpetual error from the cradle to the coffin. He is neceſſitated to correct experiment by analogy, and analogy by experiment; and not always to reſt ſatisfied in the belief of facts even with this two-fold teſtimony, till future opportunities, or the obſervations of others, concur in their ſupport.

Ignorance and credulity have ever been companions, and have miſled and enſlaved mankind; philoſophy has in all ages endeavoured to oppoſe their progreſs, and to looſen the ſhackles they had impoſed; philoſophers have on this account been called unbelievers: unbelievers of what? of the fictions of fancy, of witchcraft, hobgobblins, apparitions, vampires, fairies; of the influence of ſtars on human actions, miracles wrought by the bones of ſaints, the flights of ominous birds, the predictions from the bowels of dying animals, expounders of dreams, fortune-tellers, conjurors, modern prophets, necromancy, cheiromancy, animal magnetiſm, metallic tractors, with endleſs variety of folly? Theſe they have diſbelieved and deſpiſed, but have ever bowed their hoary heads to Truth and Nature.

Mankind may be divided in reſpect to the facility of their belief or conviction into two claſſes; thoſe, who are ready to aſſent to ſingle

facts

facts from the evidence of their ſenſes, or from the ſerious aſſertions of others; and thoſe, who require analogy to corroborate or authenticate them.

Our firſt knowledge is acquired by our ſenſes; but theſe are liable to deceive us, and we learn to detect theſe deceptions by comparing the ideas preſented to us by one ſenſe with thoſe preſented by another. Thus when we firſt view a cylinder, it appears to the eye as a flat ſurface with different ſhades on it, till we correct this idea by the ſenſe of touch, and find its ſurface to be circular; that is, having ſome parts gradually receding further from the eye than others. So when a child, or a cat, or a bird, firſt ſees its own image in a looking-glaſs, it believes that another animal exiſts before it, and detects this fallacy by going behind the glaſs to examine, if another tangible animal really exiſts there.

Another exuberant ſource of error conſiſts in the falſe notions, which we receive in our early years from the deſign or ignorance of our inſtructors, which affect all our future reaſoning by their perpetual intruſions; as thoſe habits of muſcular actions of the face or limbs, which are called tricks, when contracted in infancy continue to the end of our lives.

A third great ſource of error is the vivacity of our ideas of imagination, which perpetually intrude themſelves by various aſſociations, and compoſe

compoſe the ſarrago of our dreams; in which, by the ſuſpenſion of volition, we are precluded from comparing the ideas of one ſenſe with thoſe of another, or the incongruity of their ſucceſſions with the uſual courſe of nature, and thus to detect their fallacy. Which we do in our waking hours by a perpetual voluntary exertion, a proceſs of the mind above mentioned, which we have termed intuitive analogy. Sect. XVII. 3. 7.

This analogy preſuppoſes an acquired knowledge of things, hence children and ignorant people are the moſt credulous, as not poſſeſſing much knowledge of the uſual courſe of nature; and ſecondly, thoſe are moſt credulous, whoſe faculty of comparing ideas, or the voluntary exertion of it, is ſlow or imperfect. Thus if the power of the magnetic needle of turning towards the north, or the ſhock given by touching both ſides of an electrized coated jar, was related for the firſt time to a philoſopher, and to an ignorant perſon; the former would be leſs ready to believe them, than the latter; as he would find nothing ſimilar in nature to compare them to, he would again and again repeat the experiment, before he would give it his entire credence; till by theſe repetitions it would ceaſe to be a ſingle fact, and would therefore gain the evidence of analogy. But the latter, as having leſs knowledge of nature, and leſs facility of voluntary

exertion,

exertion, would more readily believe the aſſertions of others, or a ſingle fact, as preſented to his own obſervation. Of this kind are the bulk of mankind; they continue throughout their lives in a ſtate of childhood, and have thus been the dupes of prieſts and politicians in all countries and in all ages of the world.

In regard to religious matters, there is an intellectual cowardice inſtilled into the minds of the people from their infancy; which prevents their inquiry: credulity is made an indiſpenſable virtue; to inquire or exert their reaſon in religious matters is denounced as ſinful; and in the catholic church is puniſhed with more ſevere penances than moral crimes. But in reſpect to our belief of the ſuppoſed medical facts, which are publiſhed by variety of authors; many of whom are ignorant, and therefore credulous; the golden rule of David Hume may be applied with great advantage. "When two miraculous aſſertions oppoſe each other, believe the leſs miraculous." Thus if a perſon is ſaid to have received the ſmall-pox a ſecond time, and to have gone through all the ſtages of it, one may thus reaſon: twenty thouſand people have been expoſed to the variolous contagion a ſecond time without receiving the variolous fever, to every one who has been ſaid to have thus received it; it appears therefore leſs miraculous, that the aſſertor of this ſuppoſed fact has been deceived, or wiſhes

to deceive, than that it has ſo happened contrary to the long experienced order of nature.

M. M. The method of cure is to increaſe our knowledge of the laws of nature, and our habit of comparing whatever ideas are preſented to us with thoſe known laws, and thus to counteract the fallacies of our ſenſes, to emancipate ourſelves from the falſe impreſſions, which we have imbibed in our infancy, and to ſet the faculty of reaſon above that of imagination.

The

The Orders and Genera of the Fourth Class of Diseases.

CLASS IV.

DISEASES OF ASSOCIATION.

ORDO I.

Increased Associate Motions.

GENERA.

1. Catenated with irritative motions.
2. Catenated with sensitive motions.
2. Catenated with voluntary motions.
4. Catenated with external influences.

ORDO II.

Decreased Associate Motions.

GENERA.

1. Catenated with irritative motions.
2. Catenated with sensitive motions.
3. Catenated with voluntary motions.
4. Catenated with external influences.

ORDO III.

Retrograde Associate Motions.

GENERA.

1. Catenated with irritative motions.
2. Catenated with sensitive motions.
3. Catenated with voluntary motions.
4. Catenated with external influences.

The

The Orders, Genera, and Species, of the Fourth Class of Diseases.

CLASS IV.

DISEASES OF ASSOCIATION.

ORDO I.

Increased Associate Motions.

GENUS I.

Catenated with Irritative Motions.

SPECIES.

1. *Rubor vultûs pransorum.*	Flushing of the face after dinner.
2. *Sudor stragulis immersorum.*	Sweat from covering the face in bed.
3. *Cessatio ægritudinis cute excitata.*	Cure of sickness by stimulating the skin.
4. *Digestio aucta frigore cutaneo.*	Digestion increased by coldness of the skin.
5. *Catarrhus a frigore cutaneo.*	Catarrh from cold skin.
6. *Absorptio cellularis aucta vomitu.*	Cellular absorption increased by vomiting.
7. *Singultus nephriticus.*	Nephritic hiccough.
8. *Febris irritativa.*	Irritative fever.

GENUS

GENUS II.

Catenated with Sensitive Motions.

SPECIES.

1. *Lacrymarum fluxus sympatheticus.*	Sympathetic tears.
2. *Sternutatio a lumine.*	Sneezing from light.
3. *Dolor dentium a stridore.*	Tooth-edge from grating sounds.
4. *Risus sardonicus.*	Sardonic smile.
5. *Salivæ fluxus cibo viso.*	Flux of saliva at sight of food.
6. *Tensio mammularum viso puerulo.*	Tension of the nipples of lactescent women at sight of the child.
7. *Tensio penis in hydrophobia.*	Tension of the penis in hydrophobia.
8. *Tenesmus calculosus.*	Tenesmus from stone.
9. *Polypus narium ex ascaride.*	Polypus of the nose from ascarides.
10. *Crampus surarum in diarrhœa.*	Cramp from diarrhœa.
11. *Zona ignea nephritica.*	Nephritic shingles.
12. *Eruptio variolarum.*	Eruption of small-pox.
13. *Gutta rosea stomatica.*	Stomatic rosy drop.
14. ——— *hepatica.*	Hepatic rosy drop.
15. *Podagra.*	Gout.
16. *Rheumatismus.*	Rheumatism.
17. *Erysipelas.*	Erysipelas.

18. *Testium*

18. *Teſtium tumor in gonorrhœa.*	Swelled teſtis in gonorrhœa.
19. ——— *in parotitide.*	——— in mumps.

GENUS III.

Catenated with voluntary Motions.

SPECIES.

1. *Deglutitio invita.*	Involuntary deglutition.
2. *Nictitatio invita.*	——— nictitation.
3. *Riſus invitus.*	——— laughter.
4. *Luſus digitorum invitus.*	——— actions with the fingers.
5. *Unguium morſiuncula invita.*	——— biting the nails.
6. *Vigilia invita.*	——— watchfulneſs.

GENUS IV.

Catenated with External Influences.

SPECIES.

1. *Vita ovi.*	Life of an egg.
2. *Vita hiemi-dormientium.*	Life of winter-ſleepers.
3. *Pullulatio arborum.*	Budding of trees.
4. *Orgaſmatis venerei periodus.*	Periods of venereal deſire.
5. *Brachii concuſſio electrica.*	Electric ſhock through the arm.
6. *Oxygenatio ſanguinis.*	Oxygenation of the blood.
7. *Humectatio corporis.*	Humectation of the body.

ORDO

ORDO II.

Decreased Associate Motions.

GENUS I.

Catenated with Irritative Motions.

SPECIES.

1. *Cutis frigida pransorum.*	Chillness after dinner.
2. *Pallor urinæ pransorum.*	Pale urine after dinner.
3. ——— *a frigore cutaneo.*	——— from cold skin.
4. *Pallor ex ægritudine.*	Paleness from sickness.
5. *Dyspnœa a balneo frigido.*	Shortness of breath from cold bathing
6. *Dyspepsia a pedibus frigidis.*	Indigestion from cold feet.
7. *Tussis a pedibus frigidis.*	Cough from cold feet.
8. ——— *hepatica.*	Liver-cough.
9. ——— *arthritica.*	Gout-cough.
10. *Vertigo rotatoria.*	Vertigo rotatory.
11. ——— *visualis.*	——— visual.
12. ——— *ebriosa.*	——— inebriate.
13. ——— *febriculosa.*	——— feverish.
14. ——— *cerebrosa.*	——— from the brain.

15. *Murmur aurium vertiginosum.*	Noise in the ears.
16. *Tactus, gustus, olfactus vertiginosi.*	Vertiginous touch, taste, smell.
17. *Pulsus mollis a vomitione.*	Soft pulse in vomiting.
18. ——— *intermittens a ventriculo.*	Intermittent pulse from the stomach.
19. *Febris inirritativa.*	Inirritative fever.

GENUS II.

Catenated with Sensitive Motions.

SPECIES.

1. *Torpor genæ a dolore dentis.*	Coldness of the cheek from tooth-ach.
2. *Stranguria a dolore vesicæ.*	Strangury from pain of the bladder.
3. ——— *convulsiva.*	Convulsive strangury.
4. *Dolor termini ductûs choledochi.*	Pain of the end of the bile-duct.
5. *Dolor pharyngis ab acido gastrico.*	Pain of the throat from gastric acid.
6. *Pruritus narium a vermibus.*	Itching of the nose from worms.
7. *Cephalæa.*	Head-ach.
8. *Hemicrania et otalgia.*	Partial head-ach, and ear-ach.

9. *Dolor*

9. *Dolor humeri in hepatidide.*	Pain of ſhoulder in hepatitis.
10. *Torpor pedum variolâ erumpente*	Cold feet in eruption of ſmall-pox.
11. *Teſtium dolor nephriticus.*	Nephritic pain of teſtis.
12. *Dolor digiti minimi ſympatheticus.*	Pain of little finger from ſympathy.
13. *Dolor brachii in hydrope pectoris.*	Pain of the arm in dropſy of the cheſt.
14. *Diarrhœa a dentitione.*	Diarrhœa from toothing.

GENUS III.

Catenated with Voluntary Motions.

SPECIES.

1. *Titubatio linguæ.*	Impediment of ſpeech.
2. *Chorea ſancti Viti.*	St. Vitus' dance.
3. *Riſus.*	Laughter.
4. *Tremore ex irâ.*	Trembling from anger.
5. *Rubor ex irâ.*	Redneſs from anger.
6. —— *criminati.*	Bluſh of guilt.
7. *Tarditas paralytica.*	Slowneſs from palſy.
8. —— *ſenilis.*	—— of age.

GENUS IV.

Catenated with External Influences.

SPECIES.

1. *Somni periodus.*	Periods of ſleep.
2. *Studii inanis periodus.*	——— of reverie.
3. *Hemicraniæ periodus.*	——— of head-ach.
4. *Epilepſiæ dolorificæ periodus.*	——— of painful epilepſy.
5. *Convulſionis dolorificæ periodus.*	——— of painful convulſion.
6. *Tuſſis periodicæ periodus.*	——— of periodic cough.
7. *Catameniæ periodus.*	——— of catamenia.
8. *Hæmorrhoidis periodus.*	——— of the piles.
9. *Podagræ periodus.*	——— of the gout.
10. *Eryſipelatis periodus.*	——— of eryſipelas.
11. *Febrium periodus.*	——— of fevers.

ORDO III.

Retrograde Aſſociate Motions.

GENUS I.

Catenated with Irritative Motions.

SPECIES.

1. *Diabetes irritata.*	Diabetes from irritation.

2. *Sudor*

2. *Sudor frigidus in asthmate.*	Cold sweat in asthma.
3. *Diabetes a timore.*	Diabetes from fear.
4. *Diarrhœa a timore.*	Diarrhœa from fear.
5. *Pallor et tremor a timore.*	Paleness and trembling from fear.
6. *Palpitatio cordis a timore.*	Palpitation of the heart from fear.
7. *Abortio a timore.*	Abortion from fear.
8. *Hysteria a timore.*	Hysterics from fear.

GENUS II.

Catenated with Sensitive Motions.

SPECIES.

1. *Nausea idealis.*	Nausea from ideas.
2. ——— *a conceptu.*	Nausea from conception.
3. *Vomitio vertiginosa.*	Vomiting from vertigo.
4. ——— *a calculo in uretere.*	——— from stone in the ureter.
5. ——— *ab insultu paralytico.*	——— from stroke of palsy.
6. ——— *a titillatione faucium.*	——— from tickling the throat.
7. ——— *cute sympathetica.*	——— from sympathy with the skin.

GENUS III.

Catenated with Voluntary Motions.

SPECIES.

1. *Ruminatio.*	Rumination.
2. *Vomitio voluntaria.*	Voluntary vomiting.
3. *Eructatio voluntaria.*	——— eructation.

GENUS IV.

Catenated with External Influences.

SPECIES.

1. *Catarrhus periodicus.*	Periodical catarrh.
2. *Tussis periodica.*	Periodic cough.
3. *Hysteria a frigore.*	Hysterics from cold.
4. *Nausea pluvialis.*	Sickness against rain.

CLASS

CLASS IV.

DISEASES OF ASSOCIATION.

ORDO I.

Increaſed Aſſociate Motions.

GENUS I.

Catenated with Irritative Motions.

THE importance of the ſubſequent claſs not only conſiſts in its elucidating all the ſympathetic diſeaſes, but in its opening *a road to the knowledge of fever.* The difficulty and novelty of the ſubject muſt plead in excuſe for the preſent imperfect ſtate of it. The reader is entreated previouſly to attend to the following circumſtances for the greater facility of inveſtigating their intricate connections; which I ſhall enumerate under the following heads.

A. Aſſociate motions diſtinguiſhed from catenations.

B. Aſſociate motions of three kinds.

C. Aſſociations affected by external influences.

D. Aſſociations affected by other ſenſorial motions.

E. Aſſociations catenated with ſenſation.

F. Direct and reverse sympathy.
G. Associations affected four ways.
H. Origin of associations.
I. Of the action of vomiting.
K. Tertian associations.

A. *Associate Motions distinguished from Catenations.*

Associate motions properly mean only those, which are caused by the sensorial power of association. Whence it appears, that those fibrous motions, which constitute the introductory link of an associate train of motions, are excluded from this definition, as not being themselves caused by the sensorial power of association, but by irritation, or sensation, or volition. I shall give for example the flushing of the face after dinner; the capillary vessels of the face increase their actions in consequence of their catenation, not their association, with those of the stomach; which latter are caused to act with greater energy by the irritation excited by the stimulus of food. These capillaries of the face are associated with each other reciprocally, as being all of them excited by the sensorial power of association; but they are only catenated with those of the stomach, which are not in this case associate motions but irritative ones. The common use of the word association for almost every kind of connection has

has rendered this ſubject difficult; from which inaccuracy I fear ſome parts of this work are not exempt.

B. *Aſſociate Motions of three Kinds.*

Thoſe trains or tribes of aſſociate motions, the introductory links of which conſiſts of an irritative motion, are termed irritative aſſociations; as when the muſcles of the eyelids cloſe the eye in common nictitation. Thoſe, whoſe introductory link conſiſts of a ſenſitive motion, are termed ſenſitive aſſociations; as when the pectoral and intercoſtal muſcles act in ſneezing. And laſtly, thoſe whoſe introductory link conſiſts of a voluntary motion, are termed voluntary aſſociations; as when the muſcles of the lower limbs act in concert with thoſe of the arm in fencing.

C. *Aſſociations affected by external Influences.*

Circles of aſſociate motions, as well as trains and tribes of them, are liable to be affected by external influences, which conſiſt of ethereal fluids, and which, by penetrating the ſyſtem, act upon it perhaps rather as a cauſa ſine qua non of its movements, than directly as a ſtimulus; except when they are accumulated in unuſual quantity. We have a ſenſe adapted to the perception of the exceſs or defect of one of theſe fluids; I mean that of elementary heat; in which all things are immerſed. See Claſs IV. 1. 4. 1.

But

But there are others of them, which as we have no power to evade their influence, so we have no sense to perceive it; these are the solar, and lunar, and terrestrial gravitation, in which also all things are immersed; the electric aura, which pervades us, and is perpetually varying. See Class IV. 1. 4. 5; the magnetic fluid, Class IV. 1. 4. 6; and lastly, the great life-preserver oxygen gas, and the aqueous vapour of the atmosphere, see Class IV. 1. 4. 6. and 7. and 2.

Of these external influences those of heat, and of gravity, have diurnal periods of increase and decrease; besides their greater periods of monthly or annual variation. The manner in which they act by periodical increments on the system, till some effect is produced, is spoken of in Sect. XXXII. 3. and 6.

D. *Associations affected by other Sensorial Motions.*

Circles and trains of associate motions are also liable to be affected by their catenations with other sensorial powers, as of irritation, or sensation, or volition; which other sensorial powers either thus simply form some of the links of the catenation, or add to the energy of the associated motions. Thus when vomiting is caused by the stimulus of a stone in the ureter, the sensation of pain seems to be a link of the catenation rather than an efficient cause of the vomiting. But when the capillary vessels of the skin increase their action from

from the influence of external heat, they are excited both by the ſtimulus of unuſual heat, as well as by the ſtimulus of the blood, and by their accuſtomed aſſociation with the actions of the heart and arteries. And laſtly, in the bluſh of anger the ſenſorial power of volition is added to that of aſſociation, and irritation, to excite the capillaries of the face with increaſed action. See Claſs IV. 2. 3. 5.

E. *Aſſociations catenated with Senſation.*

Pain frequently accompanies aſſociate trains or circles of motion without its being a cauſe, or a link, of them, but ſimply an attendant ſymptom; though it frequently gives name to the diſeaſe, as head-ach. Thus in the cramp of the calves of the legs in diarrhœa, the increaſed ſenſorial power of aſſociation is the proximate cauſe; the preceding increaſed action of the bowels is the remote cauſe; and the proximate effect is the violent contractions of the muſculi gaſtrocnemii; but the pain of theſe muſcles is only an attendant ſymptom, or a remote effect. See Sect. XVIII. 15. Other ſenſitive aſſociations are mentioned in Claſs IV. 1. 2. and IV. 1. 2. 15.

Thus, if the fluſhing of the face above mentioned after dinner be called a diſeaſe, the immediate or proximate cauſe is the increaſed power of aſſociation, the remote cauſe is the increaſed

irritative motions of the ſtomach in conſequence of the ſtimulus of food and wine. The diſeaſe or proximate effect conſiſts in the increaſed actions of the cutaneous veſſels of the face; and the ſenſation of heat, the exiſtence of heat, and the red colour, are attendants or ſymptoms, or remote effects, of the increaſed actions of theſe cutaneous veſſels.

F. *Direct and reverſe Sympathy.*

The increaſed actions of the primary part of the trains of aſſociated motions are ſometimes ſucceeded by increaſed actions of the ſecondary part of the train; and ſometimes by decreaſed actions of it. So likewiſe the decreaſed actions of the primary part of a train of aſſociate motions are ſometimes ſucceeded by decreaſed actions of the ſecondary part, and ſometimes by increaſed actions of it. The former of theſe ſituations is called direct ſympathy, and the latter reverſe ſympathy. In general I believe, where the primary part of the train of aſſociated motions is exerted more than natural, it produces direct ſympathy in ſtrong people, and reverſe ſympathy in weak ones, as a full meal makes ſome people hot, and others chill. And where the primary part of the train is exerted leſs than natural, it produces direct ſympathy in weak people, and reverſe ſympathy in ſtrong ones, as

on

on being expofed for a certain length of time on horfeback in a cold day gives indigeftion and confequent heart-burn to weak people, and ftrengthens the digeftion, and induces confequent hunger in ftrong ones. See Sect. XXXV. 1.

This may perhaps be more cafily underftood, by confidering ftrength and weaknefs, when applied to animal bodies, as confifting in the quantity of fenforial power refiding in the contracting fibres, and the quantity of ftimulus applied, as fhewn in Sect. XII. 2. 1. Now when defective ftimulus, within certain limits, is partially applied to parts fubject to pepetual motion, the expenditure of fenforial power is for a while leffened, but not its general production in the brain, nor its derivation into the weakly-ftimulated part. Hence in ftrong people, or fuch whofe fibres abound with fenforial power, if the firft tribe of an affociate train of motions be deprived in part of its accuftomed ftimulus, its action becomes diminifhed; and the fenforial power becomes accumulated, and by its fuperabundance, or overflowing as it were, increafes the action of the fecond tribe of the affociate actions by reverfe fympathy. As expofing the warm fkin for a moderate time to cold air increafes the action of the ftomach, and thus ftrengthens the power of digeftion.

On the reverfe, when additional ftimulus within certain limits is partially applied to parts, which

which are defieient in reſpect to the natural quantity of ſenſorial power, the expenditure of ſenſorial power is increaſed, but in a leſs degree than the increaſed production of it in the brain, or its increaſed derivation into the ſtrongly-ſtimulated organ. Henee in weak people, or ſueh whoſe fibres are deficient of ſenſorial power, if the firſt tribe of an aſſociate train of motions be ſubjected for a while to greater ſtimulus than uſual, a greater production of ſenſorial power, or a greater derivation of it into the ſtimulated parts occurs; which by its exceſs, or overflowing as it were, increaſes the actions of the ſeeond tribe of the aſſociate motions by direct ſympathy. Thus when vomiting oceurs with cold extremities, a bliſter on the back in a few hours occaſions univerſal warmth of the ſkin, and ſtops the vomiting. And when a diarrhœa occurs with pale ſkin and cold extremities, the pricking of the points of a flannel ſhirt, worn next the ſkin, occaſions univerſal warmth of it, and checks or cures the diarrhœa.

In ſome aſſociate trains of action neverthelefs reverſe ſympathies more frequently occur than direct ones, and in others direct ones more frequently than reverſe ones. Thus in continued fever with debility there appears to be a reverſe ſympathy between the capillary veſſels of the ſtomach and thoſe of the ſkin; becauſe there exiſts a total averſion to ſolid food, and conſtant heat on

on the ſurface of the body. Yet theſe two ſyſtems of veſſels are at other times actuated by direct ſympathy, as when paleneſs attends ſickneſs, or cold feet induces indigeſtion. This ſubject requires to be further inveſtigated, as it probably depends not only on the preſent or previous plus or minus of the ſenſorial power of aſſociation, but alſo on the introduction of other kinds of ſenſorial power, as in Claſs IV. 1. 1. D; or the increaſed production of it in the brain, or the greater mobility of one part of a train of actions than another.

Thus when much food or wine is taken into the ſtomach, if there be no ſuperfluity of ſenſorial power in the ſyſtem, that is, none to be ſpared from the continual actions of it, a paleneſs and chillneſs ſucceed for a time; becauſe now the expenditure of it by the increaſed actions of the ſtomach is greater than the preſent production of it. In a little time however the ſtimulus of the food and wine increaſes the production of ſenſorial power in the brain, and this produces a ſuperfluity of it in the ſyſtem; in conſequence of which the ſkin now becomes warm and florid, which was at firſt cold and pale; and thus the reverſe ſympathy is ſhortly converted into a direct one; which is probably owing to the introduction of a ſecond ſenſorial power, that of pleaſurable ſenſation.

On the contrary, when an emetic drug produces

duces ſickneſs, the ſkin is at firſt pale for a time by direct ſympathy with the capillaries of the ſtomach; but in a few minutes, by the accumulation of ſenſorial power in the ſtomach during its leſs active ſtate in ſickneſs, the capillaries of the ſkin, which are aſſociated with thoſe of the ſtomach, act with greater energy by reverſe ſympathy, and a florid colour returns. Where the quantity of action is diminiſhed in the firſt part of a train of motions, whether by previous diminution of ſenſorial power, or preſent diminution of ſtimulus, the ſecond part of the train becomes torpid by direct ſympathy. And when the quantity of action of the firſt part becomes increaſed by the accumulation of ſenſorial power during its previous torpor, or by increaſe of ſtimulus, the actions of the ſecond part of it likewiſe become increaſed by direct ſympathy.

In moderate hunger the ſkin is pale, as before dinner, and in moderate ſickneſs, as no great accumulation of ſenſorial power has commenced; but in violent hunger, and in greater torpor of the ſtomach, as from contagious matter, the accumulation of ſenſorial power becomes ſo great as to affect the arterial and capillary ſyſtem, and fever is produced in both caſes.

In contagious fevers with arterial debility commencing with torpor of the ſtomach, why is the action of the heart weakened, and that of the capillaries increaſed? Is it becauſe the mobility of the

the heart is leſs than that of the ſtomach, and the mobility of the capillaries greater? Or is it becauſe the aſſociation between the muſcular fibres of the ſtomach and thoſe of the heart have been uniformly aſſociated by direct ſympathy; and the capillaries of the ſtomach and thoſe of the ſkin have been more frequently aſſociated by reverſe ſympathy?

Where the actions of the ſtomach have been previouſly exhauſted by long ſtimulus, as on the day after intoxication, little or no accumulation of ſenſorial power occurs, during the torpor of the organ, beyond what is required to replace the deficiency of it, and hence fever ſeldom follows intoxication. And a repetition of the ſtimulus ſometimes becomes neceſſary even to induec its natural action, as in dram-drinkers.

Where there has been no previous exhauſtion of ſenſorial power, and the primary link of aſſociate motions is violently actuated by the ſenſorial power of ſenſation, the ſecondary link is alſo violently actuated by direct ſympathy; as in inflammatory fevers. Where however the ſenſorial power of the ſyſtem is leſs than natural, the ſecondary link of aſſociated motions becomes torpid by reverſe ſympathy, as in the inoculated ſmall-pox during the eruption on the faee the feet are frequently cold.

G. *Associations affected four Ways.*

Hence associated trains or circles of motions may be affected four different ways. 1. By the greater or less energy of action of the first link, with which they are catenated, and from which they take their names; as irritative, sensitive, or voluntary associations. 2. By being excited by two or more sensorial powers at the same time, as by irritation and association, as in the instance of the application of the stimulus of increased external heat to the cutaneous capillaries. 3. By catenation with other sensorial powers, as with pain or pleasure, which are in this case not the proximate cause of motion, but which, by becoming a link of catenation, excite the sensorial power of association into action; as the pain at the neck of the gall-bladder occasioned by a gall-stone is transferred to the other end of that canal, and becomes a link of catenation between the action of the two extremities of it. 4. The influence of ethereal fluids, as of heat and gravitation. To which last perhaps might be added moisture and oxygen gas as constituting necessary parts of the system, rather than stimuli to excite it into action.

H. *The*

H. *The Origin of Associations.*

Some trains or circles of associate motions must have been formed before our nativity, as those of the heart, arteries, and capillaries; others have been associated, as occasion required them, as the muscles of the diaphragm and abdomen in vomiting; and others by perpetual habit, as those of the stomach with the heart and arteries directly, as in weak pulse during sickness; with the capillaries directly, as in the flushed skin after dinner; and lastly, with the cellular absorbents reversely, as in the increased absorption in anasarca during sickness; and with the irritative motions of the organs of sense reversely, as in vertigo, or sea-sickness. Some of these associations shall be here shortly described to facilitate the investigation of others.

First, other congeries of glands occupy but a particular part of the system, or constitute a particular organ, as the liver, or kidneys; but those glands, which secrete the mucus, and perspirable matter, which are called capillaries, are of very great extent; they receive the blood from the arteries, separate from it the mucus, which lines every cell, and covers every cavity of the body; and the perspirable matter, which softens and lubricates the whole surface of the skin, and the more extensive surface of the air-vessels, which compose

the lungs. Thefe are fupplied with blood by the perpetual action of the heart and arteries, and have therefore their motions affociated with the former, and with each other, by fympathy, which is fometimes direct, and fometimes reverfe.

One branch of this affociation, the capillaries of the fkin, is very irritable by the increafed quantities of cold and heat; another branch, that of the lungs, has not the perception of cold and heat, but is liable by direct fympathy to act in concert with the former, as in going into the cold bath. And it is probable the capillaries of the internal membranes are likewife directly affected by their fympathy with thofe of the fkin, as appears from the defect of fecretion in ulcers during the cold fits of agues.

The motions of this extenfive fyftem of capillaries, thus affociated by direct fympathy, are alfo affociated with thofe of the heart and arteries, fometimes by reverfe and fometimes by direct fympathy; and thus conftitute fimple fever. The cold paroxyfm of which confifts in their torpor, and the hot one in their orgafm, or increafed activity.

I. *Of the Action of Vomiting.*

The manner, in which the ftomach and the diaphragm and abdominal mufcles acquire their affociate

aſſociate action in vomiting, requires ſome attention. It is not probable, that this action of vomiting occurs before nativity; as the uniform application of the nutritive liquor amnii to the mouth of the fœtus, and the uniform expenditure of its nouriſhment, would not ſeem to give occaſion to too great temporary repletion of the ſtomach; and would preclude the deglutition of any improper material. After nativity the ſtomach of the child may be occaſionally too much diſtended with milk; as previous hunger may induce it to overgorge itſelf; and by repeated efforts the act of vomiting is learned, as a means of getting free from a diſagreeable ſenſation. Thus when any diſguſtful material, as a bitter drug, is taken into the mouth; certain retrograde motions of the tongue and lips are produced, for the purpoſe of putting the diſagreeable material out of the mouth again.

When the ſtomach is diſagreeably ſtimulated by the diſtention or acrimony of the aliment, a ſimilar effort to regurgitate it muſt occur; and by repeated trials the action of the diaphragm and abdominal muſcles by ſqueezing the ſtomach aſſiſts its retrograde exertion to diſgorge its contents. In the ſame manner when a piece of gravel is puſhed into the urethra, or a piece of indurated bile into the neck of the gall-bladder, after they have been in vain preſſed forward by the uſual motions of thoſe ducts, they return into the blad-

ders of gall and urine by the retrograde motions of them.

That this is one mode, in which vomiting is induced, appears from the inſtantaneous rejection from the ſtomach occaſioned by ſome nauſeous drug, or from ſome nauſeous idea; and laſtly, from the voluntary power, which ſome people have been ſaid to have acquired, of emptying their ſtomachs, much in the ſame manner as ruminating animals bring up the graſs from their firſt ſtomach.

There are nevertheleſs many modes by which theſe inverted motions of the ſtomach and œſophagus are induced, and which it is of conſequence to diſtinguiſh from each other. The firſt is the mode above deſcribed, where an effort is made to diſlodge ſomething, which ſtimulates the ſtomach into diſagreeable ſenſation; and which is returned by repeated exertions; as when a nauſeous drug is taken into the mouth, or a bit of ſand falls into the eye, or a drop of water into the wind-pipe. In this the periſtaltic motions of the ſtomach are firſt ſtopped, and then reverted by painful ſenſation; and the abdominal muſcles and diaphragm by repeated efforts become aſſociated with them. Now as leſs ſenſorial power is expended on the retrograde actions of the ſtomach, and of the lymphatics, which open their mouths on its ſurface, than by their natural motions, an accumulation of ſenſorial power in the fibres of the

the ſtomach follows the exhibition of an emetic, and on that account an emetic will ſometimes ſtop a ſpontaneous vomiting which was owing to ſenſorial deficiency. See Sect. XXXV. 1. 3. and Art. V. 2. 1.

As bitters and metallic ſalts, exhibited in ſmall doſes, ſtimulate the ſtomach into greater action, as appears by their increaſing the power of digeſtion, and yet become emetic, when given in larger doſes; one might ſuſpect, that they became emetic by inducing debility, and conſequent retrograde actions of the ſtomach, by their previouſly exhauſting the ſenſorial power by their great ſtimulus; which might be effected in a moment without producing pain, and in conſequence without our perceiving it. But on the contrary, there does not in general appear on the exhibition of emetics to be any previous exhauſtion of ſenſorial power; becauſe there is evidently an accumulation of it during the ſickneſs, as appears from the digeſtion being ſtronger afterwards; and from the increaſed action of the cellular and cutaneous abſorbents during its operation. See Art. V. 2. 1.

Another mode by which vomiting is induced, is owing to debility or deficiency of ſenſorial power, from the previous exhauſtion of it; as on the day after intoxication, or which occurs in people enfeebled with the gout, and in dropſy, and in ſome fevers with debility. In theſe, when the vomiting ceaſes, there is no appearance of ac-

cumulation of ſenſorial power, as the digeſtion ſtill remains weak and imperfect.

Another mode by which ſickneſs or vomiting is induced, is by defect of ſtimulus, as in great hunger; and in thoſe, who have been habituated to ſpice and ſpirit with their meals, who are liable to be ſick after taking food without theſe additional ſtimuli. Other means of inducing ſickneſs by vertigo, or by nauſeous ideas, will be mentioned below.

We ſhall only add, that the motions of the muſcular fibres of the ſtomach are aſſociated with thoſe of the heart and arteries by direct ſympathy, as appears by the weakneſs of the pulſe during the exhibition of an emetic; and that the abſorbents of the ſtomach are aſſociated with the cellular and cutaneous abſorbents by reverſe ſympathy, as is ſhewn by the great abſorption of the mucus of the cells in anaſarca during ſickneſs; at the ſame time that the abſorbents of the ſtomach invert their actions, and pour the mucus and water thus abſorbed into that viſcus.

In cold paroxyſms of fever the ſtomach partakes of the general torpor, and vomiting is induced by its debility, either by its aſſociation with the torpid capillaries, or other torpid parts, or by its own torpor commencing firſt, and cauſing the cold fit. The diſordered motions of the ſtomach frequently ſeem to be the cauſe or primary ſeat of fever, as where contagious miaſma are ſwallowed with the

ſaliva,

ſaliva, and where fever is produced by ſea-ſickneſs, which I once ſaw. Nevertheleſs a diſorder of the ſtomach does not always induce fever, as in that caſe it ſhould conſtantly attend indigeſtion, and vertigo, and ſea-ſickneſs; but is itſelf frequently induced by aſſociation with the diſordered movements of other parts of the ſyſtem, as when it ariſes from gravel in the ureter, or from a percuſſion on the head.

The connexion of the motions of the ſtomach with irritative ideas, or motions of the organs of ſenſe, in vertigo, is ſhewn in Sect. XX. and thus it appears, that many circles of aſſociation are either directly or reverſely aſſociated, or catenated, with this viſcus; which will much contribute to unfold ſome of the ſymptoms of fever.

K. *Tertian Aſſociations.*

The third link of aſſociate trains of motion is ſometimes actuated by reverſe ſympathy, with the ſecond link, and that by reverſe ſympathy with the firſt link; ſo that the firſt and third link may act by direct ſympathy, and the intermediate one by reverſe ſympathy. Of this, inſtances are given in the ſingultus nephriticus, Claſs IV. 1. 1. 7. and IV. 2. 1. At other times the tertian or quartan links of aſſociate motions are actuated by direct ſympathy; and that ſometimes forwards and ſometimes backwards in reſpect to the uſual order

of

of thofe trains of affociate motions, as in Clafs IV. 1. 2. 1.

SPECIES.

1. *Rubor vultûs pranforum.* Flufhing of the face after dinner is explained in Sect. XXXV. 1. In the beginning of intoxication the whole fkin becomes florid from the affociation of the actions of the cutaneous arteries with thofe of the ftomach, becaufe vinous fpirit excites the fibres of the ftomach into more violent action than the ftimulus of common food; and the cutaneous capillaries of the face, from their more frequent expofure to the viciffitudes of cold and heat, poffefs more mobility or irritability than thofe of other parts of the fkin, as further explained in Sect. XXXIII. 2. 10. Vinegar is liable to produce this flufhing of the face, which probably is owing to the quantity of vinous fpirit it contains, as I believe the unfermented vegetable acids do not produce this effect. In every kind of blufh the arterial blood is propelled into the capillaries fafter than the venous abforption can carry it forwards into the veins, in this refpect refembling the tenfio phalli.

Can the beginning vinous or acetous fermentation of the aliment in weak ftomachs contribute to this effect? or is it to be afcribed to the greater power of affociation between the arteries of

of the face and the fibres of the ſtomach in ſome people than in others?

M. M. Eat and drink leſs at a time, and more frequently. Put 20 drops of weak acid of vitriol into water to be drunk at meals. Let the dreſs over the ſtomach and bowels be looſe. Uſe no fermented liquors, or vinegar, or ſpice.

2. *Sudor ſtragulis immerſorum.* Sweat from being covered in bed. In the commencement of an epidemic fever, in which the perpetual efforts to vomit was a diſtreſſing ſymptom, Dr. Sydenham diſcovered, that if the patient's head was for a ſhort time covered over with the bed-clothes, warmth was produced, and a ſweat broke out upon the ſkin, and the tendency to vomit ceaſed. In this curious fact two trains of aſſociated motions are excited into increaſed action. Firſt, the veſſels of the lungs are known to have their motion aſſociated with thoſe of the ſkin by the difficulty of breathing on going into the cold bath, as deſcribed in Sect. XXXII. 3. 2. Hence, when the veſſels of the lungs become excited into ſtronger action, by the bad air under the bed-clothes, warmed and adulterated by frequent breathing, thoſe of the external ſkin ſoon become excited by their aſſociation into more energetic action, and generate more heat along with a greater ſecretion of perſpirable matter. Secondly, the ſympathy between the ſtomach and ſkin is evident in variety

riety of circumſtances; thus the cold air of froſty days applied to the ſkin for a ſhort time increaſes the action of the ſtomach by reverſe ſympathy, but decreaſes it if continued too long by direct ſympathy; ſo in the circumſtance above mentioned, the action of the ſtomach is increaſed by direct ſympathy with that of the ſkin; and the tendency to vomit, which was owing to its diminiſhed action, ceaſes.

3. *Ceſſatio ægritudinis cute excitatâ.* The cure of ſickneſs by ſtimulating the ſkin. This is explained in the preceding article; and further noticed in IV. 2. 2. 4. and in IV. 1. 1. F.

Similar to theſe is the effect of a bliſter on the back in relieving ſickneſs, indigeſtion, and heartburn; and, on the contrary, by theſe ſymptoms being frequently induced by coldneſs of the extremities. The bliſter ſtimulates the cutaneous veſſels into greater action; whence warmth and pain are produced at the ſame time, and the fibres of the ſtomach are excited into greater action by their aſſociation with thoſe of the ſkin. It does not appear, that the concomitant pain of the bliſter cauſes the increaſed energy of the ſtomach, becauſe the motions of it are not greater than natural; though it is ſometimes difficult to determine, whether the primary part of ſome aſſociated trains be connected with irritative or ſenſitive motions.

In the ſame manner a flannel ſhirt, to one who has

has not been in the habit of wearing one, ſtimulates the ſkin by its points, and thus ſtops vomiting in ſome caſes; and is particularly efficacious in checking ſome chronical diarrhœas, which are not attended with fever; for the abſorbents of the ſkin are thus ſtimulated into greater action, with which thoſe of the inteſtines conſent by direct ſympathy.

This effect cannot be aſcribed to the warmth alone of the flannel ſhirt, as being a covering of looſe texture, and confining air in its pores, like a ſponge, which air is known to be a bad conductor of heat, ſince in that caſe its uſe ſhould be equally efficacious, if it were worn over a linen ſhirt; and an increaſed warmth of the room of the patient would be equally ſerviceable.

4. *Digeſtio aucta frigore cutaneo.* Digeſtion increaſed by coldneſs of the ſkin. Every one has experienced the increaſe of his appetite after walking in the cool air in froſty days; for there is at this time not only a ſaving of ſenſorial power by the leſs exertion of the cutaneous veſſels; but, as theſe conſent with thoſe of the ſtomach and bowels, this ſaving of ſenſorial power is transferred by reverſe ſympathy from the cutaneous capillaries and abſorbents to thoſe of the ſtomach and inteſtines.

Hence weak people ſhould uſe the cold air of winter as a cold bath; that is, they ſhould ſtay in

it but a ſhort time at once, but ſhould immerſe themſelves in it many times a day.

5. *Catarrhus a frigore cutaneo.* Catarrh from cold ſkin. This has been already explained in Claſs I. 1. 2. 7. and is further deſcribed in Sect. XXXV. 1. 3. In this diſeaſe the veſſels of the membrane, which lines the noſtrils, are excited into greater action; when thoſe of the ſkin, with which they are aſſociated, are excited into leſs action by the deficiency of external heat, by reverſe ſympathy; and though the pain of cold attends the torpor of the primary link of this aſſociation, yet the increaſed motions of the membrane of the noſtrils are aſſociated with thoſe of the cutaneous veſſels, and not with the pain of them, becauſe no inflammation follows.

6. *Abſorptio cellulâris aucta vomitu.* In the act of vomiting the irritative motions of the ſtomach are inverted, and of the abſorbents, which open their mouths into it; while the cutaneous, cellular, and pulmonary abſorbents are induced, by reverſe ſympathy with them, to act with greater energy. This is ſeen in caſes of anaſarca, when long ſickneſs and vomiting are cauſed by ſquills, or antimonial ſalts, or moſt of all by the decoction of digitalis purpurea, foxglove; and Mr. J. Hunter mentions a caſe, in which a large bubo, which was juſt ready to break, was abſorbed in a

few

few days by ſickneſs at ſea. Treatiſe on the Blood, p. 501, which is thus accounted for; leſs ſenſorial power is expended during ſickneſs by the decreaſed action of the fibres of the ſtomach, and of its abſorbents; as ſhewn in Sect. XXXV. 1. 3. whence an accumulation of it is produced, and there is in conſequence a greater quantity of ſenſorial power for the exertion of thoſe motions, which are aſſociated with the abſorbents of the ſtomach by reverſe ſympathy.

The reverſe ſympathy between the lacteal and lymphatic branches of the abſorbent ſyſtem have been produced by the one branch being leſs excited to act, when the other ſupplies ſufficient fluid or nutriment to the ſanguiferous veſſels. Thus when the ſtomach is full, and the ſupply of chyle, and mucus, and water is in ſufficient quantity; the pulmonary, cellular, and cutaneous lymphatics are not excited into action; whence the urine is pale, and the ſkin moiſt, from the defect of abſorption on thoſe ſurfaces.

7. *Singultus nephriticus.* When a ſtone irritates the ureter, and that even without its being attended with pain or fever, ſometimes a chronical hiccough occurs, and continues for days and weeks, inſtead of ſickneſs or vomiting; which are the common ſymptoms. In this caſe the motions of the ſtomach are decreaſed by their ſympathy with thoſe of the ureter, which are increaſed

creafed by the ftimulus of the ftone in it; and the increafed motions of the diaphragm feem to exift in confequence of their affociation with the ftomach by a fecond reverfe fympathy. This hiccough may nevertheleefs admit of another explanation, and be fuppofed to be a convulfive exertion of the diaphragm to relieve the difagreeable fenfation of the ftomach in confequence of its difordered irritative affociations; and in that cafe it would belong to Clafs III. 1. 1. See Clafs IV. 2. 1. for another example of tertiary affociation.

M.M. Venefection. Emetic. Calomel. Cathartic, opium, oil of cinnamon from two to ten drops. Aerated alcaline water. Peruvian bark.

8. *Febris irritativa.* Irritative fever, defcribed in Clafs I. 1. 1. 1. The difeafes above explained in this genus are chiefly concerning the fympathies of the abforbent fyftem, or the alimentary canal, which are not fo much affociated with the arterial fyftem as to throw it into diforder, when they are flightly deranged; but when any great congeries of conglomerate glands, which may be confidered as the extremities of the arterial fyftem, are affected with torpor, the whole arterial fyftem and the heart fympathize with the torpid glands, and act with lefs energy; which conftitutes the cold fit of fever; which is therefore at firft a decreafed

creafed action of the affociate organ; but as this decreafe of action is only a temporary effect, and an increafe of exertion both of the torpid glands, and of the whole arterial fyftem, foon follows; the hot fit of irritative fever, or fever with ftrong pulfe, properly belongs to this clafs and genus of difeafes.

ORDO I.

Increaſed Aſſociate Motions.

GENUS II.

Catenated with Senſitive Motions.

THE primary links of the aſſociated actions of this genus are either produced or attended by painful or pleaſurable ſenſation. The ſecondary links of the firſt ten ſpecies are attended with increaſed motions without inflammation, thoſe of the remainder are attended with inflammation. All inflammations, which do not ariſe in the part which was previouſly torpid, belong to this genus; as the gout, rheumatiſm, eryſipelas. It is probable many other inflammations may, by future obſervation, require to be tranſplanted into this claſs.

The circles of ſenſitive aſſociate motions conſiſt chiefly of the excretory ducts of the capillaries and of the mouths of the abſorbent veſſels, which conſtitute the membranes; and which have been induced into action at the ſame time; or they conſiſt of the terminations of canals; or of parts which are endued with greater ſenſibility than thoſe which form the firſt link of the aſſociation. An inſtance of the firſt of thoſe is the ſympathy between the membranes of the alveolar proceſſes of

of the jaws, and the membranes above or beneath the muſcles about the temples in hemicrania. An inſtance of the ſecond is in the ſympathy between the excretory duct of the lacrymal gland, and the naſal duct of the lacrymal ſack. And an inſtance of the third is the ſympathy between the membranes of the liver, and the ſkin of the face in the gutta roſea of inebriates.

SPECIES.

1. *Lacrymarum fluxus ſympatheticus.* A flow of tears from grief or joy. When the termination of the duct of the lacrymal ſac in the noſtrils becomes affected either by painful or pleaſurable ſenſations, in conſequence of external ſtimulus, or by its aſſociation with agreeable or diſagreeable ideas, the motions of the lacrymal gland are at the ſame time exerted with greater energy, and a profuſion of tears ſucceeds by ſenſitive aſſociation, as explained in Sect. XVI. 8. 2.

In this caſe there exiſts a chain of aſſociated actions, the ſecretion of the lacrymal gland is increaſed by whatever ſtimulates the ſurface of the eye, at the ſame time the increaſed abundance of tears ſtimulates the puncta lacrymalia into greater action; and the fluid thus abſorbed ſtimulates the lacrymal ſac, and its naſal duct in the noſe into greater action. In a contrary direction of

this chain of aſſociation the preſent increaſe of action is induced. Firſt, the naſal duct of the lacrymal ſac is excited into increaſed action by ſome pleaſurable or painful idea, as deſcribed in Sect. XVI. 8. 2. 2d. The puncta lacrymalia or other extremity of the lacrymal ſac ſympathizes with it (as the two ends of all other canals ſympathize with each other). 3d. With theſe increaſed motions of the puncta lacrymalia thoſe of the excretory duct of the lacrymal gland are aſſociated from their having ſo perpetually acted together. And, laſtly, with the increaſed actions of the excretory duct of this gland are aſſociated thoſe of the other end of it by their frequently acting together; in the ſame manner as the extremities of other canals are aſſociated, and thus a greater flow of tears is poured into the eye.

When a flow of tears is produced in grief, it is believed to relieve the violence of it, which is worthy a further inquiry. Painful ſenſations, when great, excite the faculty of volition; and the perſon continues voluntarily to call up or perform thoſe ideas, which occaſion the painful ſenſation; that is, the afflicted perſon becomes ſo far inſane or melancholy; but tears are produced by the ſenſorial faculty of aſſociation, and ſhew that the pain is ſo far relieved as not to excite the exceſſive power of volition, or inſanity, and are therefore a ſign of the abatement of the

painful

painful ſtate of grief, rather than a cauſe of that abatement. See Claſs III. 1. 2. 10.

2. *Sternutatio a lumine.* Some perſons ſneeze from looking up at the light ſky in a morning after coming out of a dark bed room. The olfactory nerves are brought into too great action by their ſympathy with the optic nerves, or by their reſpective ſympathies with ſome intervening parts, as probably with the two extremities of the lacrymal ſac; that is, with the puncta lacrymalia and the naſal duct. See Claſs II. 1. 1. 3.

3. *Dolor dentium a ſtridore.* Tooth-edge from grating ſounds, and from the touch of certain ſubſtances, and even from imagination alone, is deſcribed and explained in Sect. XVI. 10. The increaſed actions of the alveolar veſſels or membranes are aſſociated with the ideas, or ſenſual motions of the auditory nerves in the firſt caſe; and of thoſe of the ſenſe of touch, in the ſecond caſe; and by imagination, or ideas exerted of painful ſenſation alone, in the laſt.

4. *Riſus ſardonicus.* A diſagreeable ſmile attends inflammations of the diaphragm ariſing from the aſſociations of the reiterated exertions of that muſcle with thoſe of the lips and cheeks in laughing. See Diaphragmitis, Claſs II. 1. 2. 6.

5. *Salivæ fluxus cibo viso.* The flow of saliva into the mouths of hungry animals at the sight or smell of food is seen in dogs standing round a dinner-table. The increased actions of the salivary glands have been usually produced by the stimulus of agreeable food on their excretory ducts during the mastication of it; and with this increased action of their excretory ducts the other terminations of those glands in the capillary arteries have been excited into increased action by the mutual association of the ends of canals; and at the same time the pleasurable ideas, or sensual motions, of the sense of smell and of sight have accompanied this increased secretion of saliva. Hence this chain of motions becomes associated with those visual or olfactory ideas, or with the pleasure, which produces or attends them.

6. *Tensio mammularum viso puerulo.* The nipples of lactescent women are liable to become turgid at the sight of their young offspring. The nipple has generally been rendered turgid by the titillation of the lips or gums of the child in giving suck; the visible idea of the child has thus frequently accompanied this pleasurable sensation of parting with the milk, and turgescence of the tubes, which constitute the nipple. Hence the visual idea of the child, and the pleasure which attends it, become associated with those increased arterial actions, which swell the cells of the mammula,

mula, and extend its tubes; which is very ſimilar to the tenſio phalli viſâ muliere nudâ etiam in inſomnio.

7. *Tenſio penis in hydrophobia.* An erection of the penis occurs in the hydrophobia, and is a troubleſome ſymptom, as obſerved by Cœlius Aurelianus, Fothergill, and Vaughan, and would ſeem to be produced by an unexplained ſympathy between the ſenſations about the fauces and the penis. In men the hair grows about both theſe parts, the voice changes, and the neck thickens at puberty. In the mumps, when the ſwellings about the throat ſubſide, the teſticles are liable to ſwell. Venereal infection received by the penis is very liable to affect the throat with ulcers. Violent coughs, with ſoreneſs or rawneſs about the fauces are often attended with erection of the penis; which is alſo ſaid to happen to male animals, that are hanged; which laſt circumſtance has generally been aſcribed to the obſtruction of the circulation of the blood, but is more probably occaſioned by the ſtimulus of the cord in compreſſing the throat; ſince if it was owing to impeded circulation it ought equally to occur in drowning animals.

In men the throat becomes ſo thickened at the time of puberty, that a meaſure of this is uſed to aſcertain the payment of a poll-tax on males in ſome of the iſlands of the Mediterranean, which

commences at puberty; a ſtring is wrapped twice round the thinneſt part of the neck, the ends of it are then put into each corner of the mouth; and if, when thus held in the teeth, it paſſes readily over the head, the ſubject is taxable.

It is difficult to point out by what circumſtance the ſenſitive motions of the penis and of the throat and noſe become aſſociated; I can only obſerve, that theſe parts are ſubjected to greater pleaſurable ſenſations than any other parts of the body; one being deſigned to preſerve ourſelves by the pleaſure attending the ſmell and deglutition of food, and the other to enſure the propagation of our ſpecies: and may thus gain an aſſociation of their ſenſitive motions by their being eminently ſenſible to pleaſure. See Claſs I. 3. 1. 11. and III. 1. 1. 15. and Sect. XVI. 5. See Gonorrhœa venerea, II. 1. 5. 1.

In the female ſex this aſſociation between the face, throat, noſe, and pubis, does not exiſt; whence no hair grows on their chins at the time of puberty, nor do their voices change, or their necks thicken. This happens probably from there being in them a more exquiſite ſenſitive ſympathy between the pubis and the breaſts. Hence their breaſts ſwell at the time of puberty, and ſecrete milk at the time of parturition. And in the parotitis, or mumps, the breaſts of women ſwell, when the tumor of the parotitis ſubſides. See Claſs I. 1. 2. 15. Whence it would appear, that

that their breaſts poſſeſs an intermediate ſympathy between the pubis and the throat; as they are the ſeat of a paſſion, which men do not poſſeſs, that of ſuckling children.

8. *Teneſmus calculoſus.* The ſphincter of the rectum becomes painful or inflamed from the aſſociation of its ſenſitive motions with thoſe of the ſphincter of the bladder, when the latter is ſtimulated into violent pain or inflammation by a ſtone.

9. *Polypus narium ex aſcaridibus?* The ſtimulation of aſcarides in the rectum produces, by ſenſitive ſympathy, an itching of the noſe, as explained in IV. 2. 2. 6; and in three children I have ſeen a polypus in the noſe, who were all affected with aſcarides; to the perpetual ſtimulation of which, and the conſequent ſenſitive aſſociation, I was led to aſcribe the inflammation and thickening of the membrane of the noſtrils.

10. *Crampus ſurarum in cholera.* A cramp of the muſcles of the legs occurs in violent diarrhœa, or cholera, and from the uſe of too much acid diet in gouty habits. This ſeems to ſympathize with uneaſy ſenſation in the bowels. See Claſs III. 1. 1. 14. This aſſociation is not eaſily accounted for, but is analogous in ſome degree to the paralyſis of the muſcles of the arms in colica ſaturnina.

nina. It would ſeem, that the muſcles of the legs in walking get a ſympathy with the lower parts of the inteſtines, and thoſe of the arms in variety of employment obtain a ſympathy with the higher parts of them. See Cholera and Ileus.

11. *Zona ignea nephritica.* Nephritic ſhingles. The external ſkin about the loins and ſides of the belly I ſuppoſe to have greater mobility in reſpect to ſenſitive aſſociation, than the external membrane of the kidney; and that their motions are by ſome unknown means thus aſſociated. When the torpor or beginning inflammation of this membrane ceaſes, the external ſkin becomes inflamed in its ſtead, and a kind of herpes, called the ſhingles, covers the loins and ſides of the belly. See Claſs II. 1. 5. 9.

12. *Eruptio variolarum.* After the inflammation of the inoculated arm has ſpread for a quarter of a lunation, it affects the ſtomach by reverſe ſympathy; that is, the actions of the ſtomach are aſſociated with thoſe of the ſkin; and as much ſenſorial power is now exerted on the inflamed ſkin, the other part of this ſenſitive aſſociation is deprived of its natural ſhare, and becomes torpid, or inverts its motions. After this torpor of the ſtomach has continued a time, and much ſenſorial power is thus accumulated; other parts of the ſkin, which are alſo aſſociated with it,

it, as that of the face firſt, are thrown into partial inflammation; that is the eruptions of the ſmall-pox appear on the face.

For that the variolous matter affects the ſtomach previous to its eruption on the ſkin, appears from the ſickneſs at the commencement of the fever; and becauſe, when the morbid motions affect the ſkin, thoſe of the ſtomach ceaſe; as in the gout and eryſipelas, mentioned below. The conſent between the ſtomach and the ſkin appears in variety of other diſeaſes; and as they both conſiſt of ſurfaces, which abſorb and ſecrete a quantity of moiſture, their motions muſt frequently be produced together, or in ſucceſſion; which is the foundation of all the ſympathies of animal motions, whether of the irritative, ſenſitive, or voluntary kinds.

Now as the ſkin, which covers the face, is expoſed to greater variations of heat and cold than any other part of the body; it probably poſſeſſes more mobility to ſenſitive aſſociations, not only than the ſtomach, but than any other part of the ſkin; and is thence affected at the eruption of the ſmall pox with violent action and conſequent inflammation, by the aſſociation of its motions with thoſe of the ſtomach, a day before the other parts of the ſkin; and becomes fuller of puſtules, than any other part of the body. See Claſs II. 1. 3. 9.

It might be ſuppoſed, that the ſucceſſive ſwelling

ing of the hands, when the face subsides, at the height of the small-pox, and of the feet, when the hands subside, were governed by some unknown associations of those parts of the system; but these successions of tumor and subsidence more evidently depend on the times of the eruption of the pustules on those parts, as they appear a day sooner on the face than on the hands, and a day sooner on the hands than on the feet, owing to the greater comparative mobility of those parts of the skin.

13. *Gutta rosea stomatica.* Stomatic red face. On drinking cold water, or cold milk, when heated with exercise, or on eating cold vegetables, as raw turnips, many people in harvest-time have been afflicted with what has been called a surfeit. The stomach becomes painful, with indigestion and flatulency, and after a few days an eruption of the face appears, and continues with some relief, but not with entire relief; as both the pimpled face and indigestion are liable to continue even to old age.

M. M. Venesection. A cathartic with calomel. Then half a grain of opium twice a day for many weeks. If saturated solution of arsenic three or five drops twice or thrice a day for a week?

14. *Gutta rosea hepatica.* The rosy drop of the face of some drinking people is produced like the gout

gout deſcribed below, in conſequence of an inflamed liver. In theſe conſtitutions the ſkin of the face being expoſed to greater variation of heat and cold than the membranes of the liver, poſſeſſes more mobility than thoſe hepatic membranes; and hence by whatever means theſe membranes are induced to ſympathize, when this ſenſitive aſſociation occurs, the cutaneous veſſels of the face run into greater degrees of thoſe motions, which conſtitute inflammation, than previouſly exiſted in the membranes of the liver; and then thoſe motions of the liver ceaſe. See Claſs II. 1. 4. 6.

As inflamamtion of the liver ſo frequently attends the great potation of vinous ſpirit, there is reaſon to ſuſpect, that this viſcus itſelf becomes inflamed by ſenſitive aſſociation with the ſtomach; or that, when one termination of the bile-duct, which enters the duodenum, is ſtimulated violently, the other end may become inflamed by ſenſitive aſſociation.

15. *Podagra.* The gout, except when it affects the liver or ſtomach, ſeems always to be a ſecondary diſeaſe, and, like the rheumatiſm and eryſipelas mentioned below, begins with the torpor of ſome diſtant part of the ſyſtem.

The moſt frequent primary ſeat of the gout I ſuppoſe to be the liver, which is probably affected with torpor not only previous to the annual paroxyſms

roxyſms of the gout, but to every change of its ſituation from one limb to another. The reaſons, which induce me to ſuſpect the liver to be firſt affected, are not only becauſe the jaundice ſometimes attends the commencement of gout, as deſcribed in Sect. XXIV. 2. 8. but a pain alſo over the pit of the ſtomach, which I ſuppoſe to be of the termination of the bile-duct in the duodenum, and which is erroneouſly ſuppoſed to be the gout of the ſtomach, with indigeſtion and flatulency, generally attends the commencement of the inflammation of each limb. See Arthritis ventriculi, Claſs I. 2. 4. 6. In the two caſes, which I ſaw, of the gout in the limbs being preceded by jaundice, there was a cold ſhivering fit attended the inflammation of the foot, and a pain at the pit of the ſtomach; which ceaſed along with the jaundice, as ſoon as the foot became inflamed. This led me to ſuſpect, that there was a torpor of the liver, and perhaps of the foot alſo, but nevertheleſs the liver might alſo in this caſe be previouſly inflamed, as obſerved in Sect. XXIV. 2. 8.

Now as the membranes of the joints of the feet ſuffer greater variations of heat and cold than the membranes of the liver, and are more habituated to extenſion and contraction than other parts of the ſkin in their vicinity; I ſuppoſe them to be more mobile, that is, more liable to run into extremes of exertion or quieſcence; and are thence more ſuſceptible of inflammation, than ſuch parts

as

as are lefs expofed to great variations of heat and cold, or of extenfion and contraction.

When a ftone preffes into the fphincter of the bladder, the glans penis is affected with greater pain by fympathy, owing to its greater fenfibility, than the fphincter of the bladder; and when this pain commences, that of the fphincter ceafes, when the ftone is not too large, or pufhed too far into the urethra. Thus when the membrane, which covers the ball of the great toe, fympathizes with fome membranous part of a torpid or inflamed liver; this membrane of the toe falls into that kind of action, whether of torpor or inflammation, with greater energy, than thofe actions excited in the difeafed liver; and when this new torpor or inflammation commences, that with which it fympathizes ceafes; which I believe to be a general law of affociated inflammations.

The paroxyfms of the gout would feem to be catenated with folar influence, both in refpect to their larger annual periods, and to their diurnal periods—See Sect. XXXVI. 3. 6—as the former occur about the fame feafon of the year, and the latter commence about an hour before fun-rife; nevertheleefs the annual periods may depend on the fucceffion of great viciffitudes of cold and heat, and the diurnal ones on our increafed fenfibility to internal fenfations during fleep, as in the fits of afthma, and of fome epilepfies. See Sect. XVIII. 15.

In

In refpect to the pre-remote caufe or difpofition to the gout, there can be no doubt of its individually arifing from the potation of fermented or fpirituous liquors in this country; whether opium produces the fame effect in the countries, where it is in daily ufe, I have never been well informed. See Sect. XXI. 10. where this fubject is treated of; to which I have to add, that I have feen fome, and heard of others, who have moderated their paroxyfms of gout, by diminifhing the quantity of fermented liquors, which they had been accuftomed to; and others who, by a total abftinence from fermented liquors, have entirely freed themfelves from this excruciating malady; which otherwife grows with our years, and curtails or renders miferable the latter half, or third, of the lives of thofe, who are fubject to it. The remote caufe is whatever induces temporary torpor or weaknefs of the fyftem; and the proximate caufe is the inirritability, or defective irritation, of fome part of the fyftem; whence torpor and confequent inflammation. The great Sydenham faw the beneficial effects of the abftinence from fermented liquors in preventing the gout, and adds, "if an "empiric could give fmall-beer only to gouty "patients as a noftrum, and perfuade them "not to drink any other fpirituous fluids, he "might refcue thoufands from this difeafe, and "acquire a fortune for his ingenuity." Yet it is to be lamented, that this accurate obferver of difeafes had not refolution to practife his own prefcription,

ſcription, and thus to have ſet an example to the world of the truth of his doctrine; but, on the contrary, recommended Madeira, the ſtrongeſt wine in common uſe, to be taken in the fits of the gout, to the detriment of thouſands; and is ſaid himſelf to have periſhed a martyr to the diſeaſe, which he knew how to ſubdue!

As example has more forcible effect than ſimple aſſertion, I ſhall now conciſely relate my own caſe, and that of one of my moſt reſpected friends. E. D. was about forty years of age, when he was firſt ſeized with a fit of the gout. The ball of his right great toe was very painful, and much ſwelled and inflamed, which continued five or ſix days in ſpite of veneſection, a briſk cathartic with ten grains of calomel, and the application of cold air and cold water to his foot. He then ceaſed to drink ale or wine alone; confining himſelf to ſmall-beer, or wine diluted with about thrice its quantity of water. In about a year he ſuffered two other fits of the gout, in leſs violent degree. He then totally abſtained from all fermented liquors, not even taſting ſmall-beer, or a drop of any kind of wine; but ate plentifully of fleſh-meat, and all kinds of vegetables, and fruit, uſing for his drink at meals chiefly water alone, or lemonade, or cream water; with tea and coffee between them as uſual.

By this abſtinence from fermented liquors he kept quite free from the gout for fifteen or ſix-

teen years; and then began to take ſmall-beer mixed with water occaſionally, or wine and water, or perry and water, or cyder and water; by which indulgence after a few months he had again a paroxyſm of gout, which continued about three days in the ball of his toe; which occaſioned him to return to his habit of drinking water, and he has now for above twenty years kept in perpetual health, except accidental colds from the changes of the ſeaſons. Before he abſtained from fermented or ſpirituous liquors, he was frequently ſubject to the piles, and to the gravel, neither of which he has ſince experienced.

In the following caſe the gout was eſtabliſhed by longer habit and greater violence, and therefore required more cautious treatment. The Rev. R. W. was ſeized with the gout about the age of thirty-two, which increaſed ſo rapidly that at the age of forty-one he was confined to his room ſeven months in that year; he had ſome degree of lameneſs during the intervals, with chalky ſwellings of his heels and elbows. As the diſeaſe had continued ſo long and ſo violently, and the powers of his digeſtion were ſomewhat weakened, he was adviſed not entirely to leave off all fermented liquors; and as ſmall-beer is of ſuch various ſtrength, he was adviſed to drink exactly two wine glaſſes, about four ounces, of wine mixed with three or four times its quantity of water, with or without lemon and ſugar, for his daily potation at dinner,

dinner, and no other fermented liquor of any kind; and was advised to eat flesh-meat with any kind of boiled vegetables, and fruit, with or without spice. He has now scrupulously continued this regimen for above five years, and has had an annual moderate gouty paroxysm of a few weeks, instead of the confinement of so many months, with great health and good spirits during the intervals.

The following is a more particular account of the history of this case; being part of a letter which Mr. Wilmot wrote on that subject at my entreaty.

"I entered into the army with an excellent constitution at the age of fifteen. The corps I served in was distinguished by its regularity, that is, the regular allowance of the mess was only one pint of wine per man each day; unless we had company to dine with us; then, as was the general custom of the time, the bottle circulated without limit. This mode of living, though by no means considered as excess for men, was certainly too great for a youth of my age. This style of living I continued, when with the regiment, till the latter end of the year 1769, when I had the misfortune to sleep in a damp bed at Sheffield on a journey to York, but arrived there before I felt the ill effects of it. I was then seized with a violent inflammatory rheumatism with great inflammation of my eyes, and was attended by Dr. Dealtry; so violent was the disorder, that I was

bled for it eight times in leſs than a fortnight; and was three months, before I could conſider my health perfectly reeſtabliſhed. Dr. Dealtry told me, that I ſhould be ſubject to ſimilar attacks for many years; and that he had no doubt, from the tendency he found in my habit to inflammation, that, when I was farther advanced in life, I ſhould change that complaint for the gout. He predicted truly; for the three ſucceeding winters I had the ſame complaint, but not ſo violently; the fourth winter I eſcaped, and imputed my eſcape to the continuance of cold bathing during the whole of that winter; after that I never eſcaped it, till I had a regular and ſevere fit of the gout: after the firſt attack of rheumatic fever I was more abſtemious in my manner of living, though when in company I never ſubjected myſelf to any great reſtraint. In the year 1774 I had quitted the army, and being in a more retired ſituation, was ſeldom led into any exceſs; in 1776 and 1777 I was in the habit of drinking a good deal of wine very frequently, though not conſtantly. After that period till the year 1781, I drank a larger quantity of wine regularly, but very ſeldom to any degree of intoxication. I lived much at that time in the ſociety of ſome gentlemen, who uſually drank nearly a bottle of wine daily after dinner. I muſt here however obſerve, that at no part of my life was I accuſtomed to drink wine in an evening, and very ſeldom drank any thing more than a ſingle

ſingle half-pint glaſs of ſome ſort of ſpirits diluted with much water. Till the year 1781 I had always been accuſtomed to uſe very violent and continued exerciſe on horſe-back; in the winter months I purſued all field diverſions, and in the ſummer months I rode frequent and long journeys; and with this exerciſe was liable to perſpire to great exceſs; beſides which I was ſubject to very profuſe night-ſweats, and had frequently boils break out all over me, eſpecially in the ſpring and autumn; for which I took no medicine, except a little of the flowers of ſulphur with cream of tartar in honey.

"You will obſerve I bring every thing down to the date of 1781. In the month of October in that year, when I was juſt entered into the thirty-ſecond year of my age, I had the firſt attack of gout; that fit was very ſevere, and of many weeks continuance. I now determined upon a more abſtemious method of living, in reſpect to wine; and indeed the ſociety, in which I had before been accuſtomed to live, being conſiderably changed, I had leſs frequent temptations to exceſs. From this time I enjoyed the moſt perfect good ſtate of health till Auguſt 1784, when I had my ſecond attack of gout. I never perfectly recovered from this attack through the ſucceeding winter, and in March 1785 was adviſed to try the Bath waters, and drank them under the direction of one of the faculty of that place. I was there

ſoon ſeized with a fever, and a ſlight attack of gout in one knee. I ſhould obſerve, that when I ſet out from home, I was in a weak and low ſtate, and unequal to much fatigue; as appeared by my having a fainting fit one day on the road, after having travelled only about fifty miles; in the courſe of the ſummer I had two or three more ſlight attacks of gout of leſs conſequence, till the month of October; when I was afflicted with it all over me in ſuch a manner, as to be without the poſſibility of the leaſt degree of removal for ſome days; and was about two months without being able to get into the air. This was the ſevereſt attack I had then experienced; though I have ſince had ſeveral equally ſevere. In the courſe of this ſummer I had a fall with my horſe; and ſoon after it, having diſcovered an enlargement on one elbow, I concluded I had hurt it at that time; but in the courſe of this laſt attack having a ſimilar enlargement on the other elbow, I found my miſtake, and that they were collections of gouty matter; theſe increaſed to the ſize of pullet's eggs, and continue in that ſtate. I had ſoon after ſimilar enlargements on my heels; the right heel being ſeverely bruiſed, I was under the neceſſity of having it lanced, and a large quantity of chalky matter was diſcharged from it; and have ſince that time frequently had chalky matter taken from it, and ſometimes ſmall bits of apparently perfect chalk. My right hand was ſoon afflicted

in

in the ſame way, and I have ſcarcely a joint on thoſe fingers now in a natural ſtate. My left hand has eſcaped tolerably well. After this laſt attack (viz. October 1785), I had two or three ſlight attacks before the month of June 1787, when I had a very ſevere intermittent fever; from that time I continued very well till the latter end of the year, when I began to feel the gout about me very much, but was not confined by it. I was in this ſtate adviſed to try what is called the American Recipe (gum guaiacum and nitre diſſolved in ſpirits); it had apparently been of eſſential ſervice to a friend of mine, who from the inability to walk a mile for ſome years, was believed to be reſtored by the uſe of this medicine to a good ſtate of health, ſo as to walk ten miles a day. In addition to this medicine I drank, as my common beverage with my meals, ſpruce beer. I had ſo high an opinion of this medicine in the gout, and of ſpruce beer as an antiſcorbutic, that I contemplated with much ſatisfaction, and with very little doubt, the perfect reſtoration of my health and ſtrength; but I was miſerably deceived; for in September 1788 I was ſeized with the gout in a degree that none but arthritics, and indeed but few of theſe, can eaſily conceive. From this time till Auguſt 1789 I ſcarcely ever paſſed a comfortable day; ſeven months of this time I had been confined, my health ſeemed much impaired, my ſtrength was diminiſhed, and my appetite almoſt

gone. In this ſtate my friends preſſed me to conſult you. I was unwilling for ſome time to do it, as I had loſt all hope of relief; however, when I had determined to apply to you, I likewiſe determined to give up every prejudice of my own reſpecting my caſe, and to adhere moſt ſtrictly to your advice. On the 20th of Auguſt 1789 I conſulted you, on the 25th I entered upon the regimen, which you preſcribed, and which was as follows.

"Drink no malt liquor on any account. Let "your beverage at dinner conſiſt of two glaſſes "of wine diluted with three half-pints of water. "On no account drink any more wine or ſpiritu- "ous liquors in the courſe of the day; but, if "you want more liquid, take cream and water, "or milk and water, or lemonade, with tea, "coffee, chocolate. Uſe the warm bath twice a "week for half an hour before going to bed, at "the degree of heat which is moſt grateful to your "ſenſations. Eat meat conſtantly at dinner, and "with any kind of tender vegetables you pleaſe. "Keep the body open by two evacuations daily, "if poſſible without medicine, if not take the "ſize of a nutmeg of lenitive electuary occaſion- "ally, or five grains of rhubarb every night. Uſe "no violent exerciſe, which may ſubject yourſelf "to ſudden changes from heat to cold; but as "much moderate exerciſe as may be, without "being much fatigued or ſtarved with cold.

"Take

"Take ſome ſupper every night; a ſmall quan-
"tity of animal food is preferred; but if your
"palate refuſes this, take vegetable food, as fruit-
"pie, or milk; ſomething ſhould be eaten, as it
"might be injurious to you to faſt too long."
To the whole of this I adhered moſt ſcrupulouſly, and ſoon found my appetite improve, and with it my ſtrength and ſpirits. I had in December a ſevere attack, and two or three ſlight ones in the courſe of twelve months; but the improvement in the general ſtate of my health induced me to perſevere. On the 18th of Auguſt 1790 I had another ſevere attack, but it went off eaſier than before, and I ſoon recovered ſufficiently to go to Buxton, which you adviſed me to, and from which I reaped great benefit; nevertheleſs on the 29th of December I had a ſlight attack in compariſon of ſome that I had before experienced, and from that time I was free from gout, and enjoyed my health perfectly well till the fourth week in October 1791; from that till the third week in October 1792; from that till the third week in October 1793; and from that till June 1794. From what happened for the laſt three years I dreaded the month of October; but I eſcaped then, and have enjoyed my health moſt perfectly ever ſince till within the laſt week, that I have had a ſlight attack in one knee, which is nearly gone, without any ſymptom to lead me to ſuppoſe that it will go further.

"I adhered

"I adhered to your advice moſt ſcrupulouſly for the firſt year; and in regard to the not drinking malk liquor, and taking only the two glaſſes of wine with water, I have never deviated but two days; and then the firſt day I only drank one glaſs of ale and one glaſs of champaigne; on the ſecond only one glaſs of champaigne. With regard to the warm bath, I only uſe it now when I have gouty ſymptoms upon me, and in ſuch ſituations I find it of infinite ſervice; and in other reſpects I continue to live according to your direction.

"Many perſons have laughed at the idea of my perſeverance in a ſyſtem, which has not been able to *cure* the gout after five years trial; but ſuch perſons are either ignorant of what I before ſuffered, or totally unacquainted with the nature of the diſorder. Under the bleſſing of Providence, by an adherence to your advice, I am reaping all the benefit you flattered me I might expect from it, viz. my attacks leſs frequent, my ſufferings leſs acute, and an improvement in the general ſtate of my health.

"I have been particular in this account of myſelf at your requeſt, and am, Sir, &c.

MORLEY, near DERBY,
February 10th, 1795. ROBERT WILMOT."

There are ſituations nevertheleſs in which a paroxyſm of gout has been believed to be deſirable,

able, as relieving the patient from other disagreeable diseases, or debilities, or sensations. Thus when the liver is torpid, a perpetual uneasiness and depression of spirits occur; which a fit of gout is supposed to cure by a metastasis of the disease. Others have acquired epileptic fits, probably from the disagreeable sensation of a chronically inflamed liver; which they suppose the pain and inflammation of gout would relieve. When gouty patients become much debilitated by the progress of the disease, they are liable to dropsy of the chest, which they suppose a fit of the gout would relieve. But in all these cases the attempt to procure a paroxysm of gout by wine, or aromatics, or volatiles, or blisters, or mineral waters, seldom succeeds; and the patients are obliged to apply to other methods of relief adapted to their particular cases. In the two former situations small repeated doses of calomel, or mercurial unction on the region of the liver, may succeed, by giving new activity to the vessels of the liver, either to secrete or to absorb their adapted fluids, and thus to remove the cause of the gout, rather than to promote a fit of it. In the last case the tincture of digitalis, and afterwards the class of sorbentia, must be applied to.

M. M. In young strong patients the gout should be cured by venesection and cathartics and diluents, with poultices externally. But it has

a natural

a natural crisis by producing calcareous matter on the inflamed membrane, and therefore in old enfeebled people it is safest to wait for this crisis, attending to the natural evacuations and the degree of fever; and in young ones, where it is not attended with much fever, it is customary and popular not to bleed, but only to keep the body open with aloes, to use gentle sudorifics, as neutral salts, and to give the bark at the decline of the fit; which is particularly useful where the patient is much debilitated. See Arthritis ventriculi, Class I. 2. 4. 6. and Sect. XXV. 17.

Mr. Kelly, surgeon in the navy, in an ingenious treatise, printed at Edinb. 1797, termed Observations on Compression by the Tourniquet, advises in both inflammatory and chronic rheumatism to compress the artery of the affected limb by the tourniquet, for 15 or 20 minutes, relaxing or tightening the bandage, as the patient seems to bear it. And in inflammatory rheumatism, he advises to take blood from a vein below the bandage, which he says relieves the pain and destroys the inflammation. Could not this experiment be used safely in the gout of young or strong patients? and perhaps with speedy success?

When there is not much fever, and the patient is debilitated with age, or the continuance of the disease, a moderate opiate, as twenty drops of tincture of opium, or one grain of solid opium, may

may be taken every night with advantage. Externally a paſte made with double the quantity of yeſt is a good poultice; and booterkins made with oiled ſilk, as they confine the perſpirable matter, keep the part moiſt and ſupple, and thence relieve the pain like poultices.

The only ſafe way of moderating the diſeaſe is by an uniform and equal diminution, or a total abſtinence from fermented liquors, with the cautions directed in Sect. XII. 7. 8. The continued uſe of ſtrong bitters, as of Portland's powder, or bark, has been frequently injurious, as ſpoken of in the Materia Medica, Art. IV. 2. 11.

One of my acquaintance, who was much afflicted with the gout, abſtained for about half a year from beer and wine; and not having reſolution to perſiſt, returned to his former habits of potation in leſs quantity; and obſerved that he was then for one winter ſtronger and freer from the gout than uſual. This however did not long continue, as the diſeaſe afterwards returned with its uſual or increaſed violence. This I think is a circumſtance not unlikely to occur, as opium has a greater effect after its uſe has been a while intermitted; and the debility or torpor, which is the cauſe of gout, is thus for a few months prevented by the greater irritability of the ſyſtem, acquired during the leſſened uſe of fermented liquor.

For

For the ſame reaſon an ounce of ſpirituous tincture of guaiacum, or of bark, is ſaid to have for ſome time prevented returns of the gout; which has afterwards, like all other great ſtimuli when long continued, been ſucceeded by greater debility, and deſtroyed the patient. This ſeems to have been exemplified in the caſe of the ingenious Dr. Brown, ſee Preface to his Elementa Medicinæ; he found temporary relief from the ſtimulus of wine, regardleſs of its future effects.

Laſtly, as the gouty inflammation, like the rheumatic ſwellings of the wriſts and ankles, is not a primary diſeaſe; and is like them not liable to ſuppurate; there is reaſon to believe that opiates may be given with leſs danger than in other inflammations, and with a proſpect of advantage; ſince by preventing the periods of torpor of the liver, or other part, primarily affected, the diurnal additional attack, or its producing inflammation of another limb, may ſometimes be prevented. A perſon a few days ago aſſured me, that when the gout came into his foot, his practice was to take thirty drops of tincture of opium; and in half an hour thirty drops more; and even a third doſe, if the pain did not ſubſide; and that the fit ſoon ceaſed. I ſhould think this a dangerous experiment. A Mr. Warner wrote a book recommending opium in the gout, but died ſoon after its publication.

16. *Rheumatiſmus.*

16. *Rheumatiſmus.* Acute rheumatiſm. There is reaſon to ſuſpect, that rheumatic inflammations, like the gouty ones, are not a primary diſeaſe; but that they are the conſequence of a tranſlation of morbid action from one part of the ſyſtem to another. This idea is countenanced by the frequent change of place of rheumatic-like gouty inflammations, and from their attacking two ſimilar parts at the ſame time, as both ankles and both wriſts, and theſe attacks being in ſucceſſion to each other. Whereas it is not probable that both feet or both hands ſhould at the ſame time be equally expoſed to any external cauſe of the diſeaſe, as to cold or moiſture; and leſs ſo that theſe ſhould occur in ſucceſſion. Laſtly, from the inflammatory diatheſis in this diſeaſe being more difficult to ſubdue, and more dangerous in event, than other common inflammations, eſpecially to pregnant women, and in weak conſtitutions.

From this idea of the rheumatiſm being not a primary diſeaſe, like the gout, but a transferred morbid action owing to the previous torpor of ſome other part of the ſyſtem, we perceive why it attacks weak people with greater pertinacity than ſtrong ones; reſiſting or recurring again and again after frequent evacuations, in a manner very different from primary inflammations; becauſe the cauſe is not removed, which is at a diſtance from the ſeat of the inflammation.

This

This alſo accounts for rheumatic inflammations ſo very rarely terminating in ſuppuration, becauſe like the gout the original cauſe is not in the inflamed part, and therefore does not continue to act after the inflammation commences. Inſtead of ſuppuration in this diſeaſe, as well as in the gout, a quantity of mucus or coagulable lymph is formed on the inflamed membrane; which in the gout changes into chalkſtones, and in the rheumatiſm is either reabſorbed, or lies on the membrane, producing pains on motion long after the termination of the inflammation, which pains are called chronic rheumatiſm. The membranes, which have thus been once or repeatedly inflamed, become leſs mobile, or leſs liable to be affected by ſympathy, as appears by the gout affecting new parts, when the joints of the foot have been frequently inflamed by it; hence as the cauſe of the inflammation does not exiſt in the inflamed part, and as this part becomes leſs liable to future attacks, it ſeldom ſuppurates.

Pleurodyne rheumatica. When rheumatiſm affects the muſcles of the cheſt, it produces ſymptoms ſimilar to pleuriſy, but diſtinguiſhed from it by the patient having previouſly ſuffered rheumatic affections in other parts, and by the pertinacity or continuance of the inflammatory ſtate of the patient. This ſhould be termed pleurodyne rheumatica.

Enteralgia rheumatica. When rheumatic inflammation

flammation affects the bowels, it produces a diſeaſe very different from enteritis, or common inflammation of the bowels, and ſhould be termed enteralgia rheumatica. The pain is leſs than in enteritis, and the diſeaſe of longer continuance, with harder pulſe, and the blood equally ſizy. It is attended with frequent dejections, with much mucus, and previous griping pains, but without vomiting; and differs perhaps from dyſentery from its not being attended with bloody ſtools, and not being infectious.

Rheumatic inflammations, which I believe to ariſe from the ſympathy of the inflamed part with the torpor of ſome diſtant part, may I think be certainly diſtinguiſhed from thoſe inflammations of the ſame part, which have not ariſen from ſympathy with the torpor of ſome diſtant part, but where the cauſe of the inflammation began in the part where the inflammation exiſts, by this circumſtance; that in rheumatic inflammation the hard or ſharp pulſe continues at about 118 in a minute after the pain abates or ceaſes. Whereas in the latter the inflammatory fever ceaſes along with the pain.

In two caſes of pain of the ſide, and diffieult reſpiration, which I eſteemed rheumatic, as the hard pulſe of 118 with ſized blood continued after repeated veneſection, gentle cathartics, and mild antimonials, I found ten drops of ſaturated tincture of digitalis given every ſix hours ap-

pear to produce great good effect, and to abate and remove the inflammatory diathesis in three or four days.

Hence when a fever has continued more than one lunar period, attended with a hard or sharp pulse of 118 or 120 in a minute, and is not attended with cough or symptoms of absorbed matter, it may be esteemed of rheumatic origin, though no local pain or inflammation at present exists; and this with greater certainty, if pain had previously existed: for no fevers, except the hectic fevers from absorbed matter, and this attended with inflammatory diathesis, and which may be called rheumatic, ever properly extend, I believe, beyond one lunation; though symptoms of debility may continue a while longer. This observation is worth attending to in practice, as it distinguishes the kind of fever, in which when the bark is erroneously given, it does no service, and in which I believe saturated tincture of digitalis given as above to be the most efficacious medicine.

Rheumatismus suppurans. There is another kind of rheumatism attended with debility, which suppurates, and should be termed rheumatismus suppurans. It is generally believed to be the gout, till suppuration takes place on the swelled joint; and, as the patient sinks, there are sloughs formed over the whole mouth; and he seems to be destroyed by inflammation or gangrene of the mucous

mucous membranes. I have twice ſeen this diſeaſe in patients about ſixty. Some other diſeaſes are erroneouſly called rheumatic, as hemicrania, and odontalgia. See Sect. XXVI. 3.

M. M. In the three former kinds veneſection repeatedly. Cathartics. Antimonials. Diluents. Neutral ſalts. Oil. Warm bath. Afterwards the bark. Opium with or without ipecacuanha; but not till the patient is conſiderably weakened. Sweats forced early in the diſeaſe do injury. Opium given early in the diſeaſe prolongs it. In the laſt kind, gentle ſtimulants, as wine and water, mucilage, ſorbentia.

In acute rheumatiſm, when the ſwelling of the joints firſt affected ſubſides, a return of torpor in the part primarily diſeaſed commences previous to an inflammation of the joints ſecondarily affected. Hence when the tumor of the joints firſt affected ſubſides, half a grain of opium, every night, and Peruvian bark, or other bitter medicine, may be given to prevent this return of torpor with great advantage; if the patient has previouſly been properly evacuated, and is not now too much inflamed.

Dr. Fordyce aſſerts, that when it was the practice to bleed largely in acute rheumatiſm, a metaſtaſis frequently took place to the interior parts of the body, and deſtroyed the patient. And adds, that during the laſt fifteen years of his practice this has rarely happened, as he has en-

tirely left off bleeding in the acute rheumatiſm. Third diſſertation on fever by G. Fordyce, M. D. London, Johnſon. On this ſubject it may be remarked, that as rheumatiſm like gout is a ſecondary diſeaſe, the inflammation of one part being ſymptomatic, the ſeat of torpor exiſting in ſome other part, it may not be ſo conſtantly neceſſary to bleed ſo copiouſly in thoſe ſecondary inflammatory diſeaſes, as in thoſe primary ones, where the inflamed part was previouſly the ſeat of torpor, as in pleuriſy, peripneumony, and enteritis; but in rheumatiſm, as well as in erysipelas, I am convinced, that where the inflammation of the ſyſtem is great, repeated veneſection is not only uſeful; but that thoſe, who periſh by either of thoſe diſeaſes, periſh for the want of veneſection early, where the attack is violent. And laſtly, that even in the gout of young and ſtrong ſubjects, as I know by experience on myſelf, a moderate veneſection ſhortens the fit, and leſſens I believe the hazard of metaſtaſis.

The following is a caſe of ſuppurative rheumatiſm. Mr. F——, about ſixty, was ſuppoſed to have the gout in his hand, which however ſuppurated, and it was then called the ſuppurative rheumatiſm. He had lived rather intemperately in reſpect to wine, and was now afflicted with a tendency to inflammation of the mucous membranes. As he lay on the bed half reſupine, propped up with pillows, and alſo ſlept in that

poſture,

poſture, his lower jaw dropped by its own weight, when the voluntary power of the muſcles was ſuſpended. The mucus of his mouth and throat became quite dry, and at length was ſucceeded by ſloughs; this was a moſt diſtreſſing circumſtance to him, and was in vain endeavoured to be relieved by ſupporting his jaw by ſlender ſteel ſprings fixed to his night-cap, and by ſprings of elaſtic gum. The ſloughs ſpread and ſeemed to accelerate his death. See Claſs I. 1. 3. 2.

In acute rheumatiſm Mr. Kellie aſſerts that he has had great ſucceſs by putting a tourniquet on the affected limb, ſo as to compreſs the artery, and then by taking blood from a vein below the bandage, as mentioned above in Podagra. Claſs IV. 1. 2. 15.

17. *Eryſipelas.* The eryſipelas differs from the zona ignea, and other ſpecies of herpes, in its being attended with fever, which is ſometimes of the ſenſitive irritated or inflammatory kind, with ſtrong and full pulſe; and at other times with weak pulſe and great inirritability, as when it precedes or attends mortifications. See Claſs II. 1. 3. 2.

Like the zona ignea above deſcribed, it ſeems to be a ſecondary diſeaſe, having for its primary part the torpor or inflammation of ſome internal or diſtant membrane, as appears from its ſo frequently attending wounds; ſometimes ſpreading

from iſſues over the whole limb, or back, by ſympathy with a tendon or membrane, which is ſtimulated by the peaſe in them. In its more violent degree I ſuppoſe that it ſympathizes with ſome extenſive internal membranes, as of the liver, ſtomach, or brain. Another reaſon, which countenances this idea, is, that the inflammation gradually changes its ſituation, one part healing as another inflames; as happens in reſpect to more diſtant parts in gout and rheumatiſm; and which ſeems to ſhew, that the cauſe of the diſeaſe is not in the ſame place with the inflammation. And thirdly, becauſe the eryſipelas of the face and head is liable to affect the membranes of the brain; which were probably in theſe caſes the original or primary ſeat of the diſeaſe; and laſtly, becauſe the fits of eryſipelas, like thoſe of the gout, are liable to return at certain annual or monthly periods, as further treated of in Claſs II. 1. 3. 2.

Many caſes of eryſipelas from wounds or bruiſes are related in Default's Surgical Journal, Vol. II. in which poultices are ſaid to do great injury, as well as oily or fatty applications. Saturnine ſolutions were ſometimes uſed with advantage. A grain of emetic tartar given to clear the ſtomach and bowels, is ſaid to be of great ſervice.

18. *Teſtium tumor in gonorrhœa.* Mr. Hunter in his Treatiſe on the Venereal Diſeaſe obſerves, that

that the tumor of the teſtes in gonorrhœa ariſes from their ſympathy with the inflammation of the urethra; and that they are not ſimilar to the actions ariſing from the application of venereal matter, whether by abſorption or otherwiſe; as they ſeldom or never ſuppurate; and when ſuppuration happens, the matter produced is not venereal. Treatiſe on Venereal Diſeaſe, p. 53.

19. *Teſtium tumor in parotidite.* The ſympathy between ſome parts about the throat and the genitals has been treated of in Claſs IV. 1. 2. 7. The ſwelling of the teſtes, when that of the parotis ſubſides, ſeems to ariſe from the aſſociation of ſucceſſive action; as the tenſion of the penis in hydrophobia appears to ariſe from the previous ſynchronous aſſociations of the ſenſitive motions of theſe parts; but the manner of the production of both theſe aſſociations is yet very obſcure. In women a ſwelling of the breaſts often ſucceeds the decline of the mumps by another wonderful ſympathy. See Claſs IV. 1. 2. 7. and I. 1. 2. 15. In many perſons a delirium ſucceeds the ſwelling of the parotis, or the ſubſequent ones of the teſtes or breaſts; which is ſometimes fatal, and ſeems to ariſe from a ſympathy of ſucceſſive action, and not of ſynchronous action, of the membranes of the brain with thoſe of the parotid glands. Sometimes a ſtupor comes on inſtead of this delirium, which is relieved by fomenting the ſhaved head for an hour or two. See Claſs II. 1. 3. 4.

ORDO I.

Increaſed Aſſociate Motions.

GENUS III.

Catenated with Voluntary Motions.

SPECIES.

1. *Deglutitio invita.* When any one is told not to ſwallow his ſaliva, and that eſpecially if his throat be a little ſore, he finds a neceſſity of immediately ſwallowing it; and this the more certainly, the more he voluntarily endeavours not to do ſo.

In this caſe the voluntary power exerted by our attention to the pharynx renders it more ſenſible to irritation, and therefore occaſions it to be more frequently induced to ſwallow the ſaliva. Here the irritation induces a volition to ſwallow it, which is more powerful than the deſire not to ſwallow it. See XXIV. 1. 7. So in reverie, when the voluntary power was exerted on any of the ſenſes, as of ſight or taſte, the objects of thoſe ſenſes became perceived; but not otherwiſe. Sect. XIX. 6. This is a troubleſome ſymptom in ſome ſore throats.

M. M. Mucilage, as ſugar and gum arabic.

Warm water held in the mouth frequently, as a fomentation to the inflamed throat.

2. *Nictitatio invita.* Involuntary winking with the eye-lids, and twitchings of the face, are originally induced by an endeavour to relieve ſome diſagreeable ſenſations about inflamed eyes, as the dazzling of light; and afterwards theſe motions become catenated with other motions or ſenſations, ſo as not to be governed by the will. Here the irritation firſt produces a volition to wink, which by habit becomes ſtronger than the antivolition not to wink.

This ſubject is rendered difficult from the common acceptation of the word, volition, including previous deliberation, as well as the voluntary exertion, which ſucceeds it. In the volitions here ſpoken of there is no time for deliberation or choice of objects, but the voluntary act immediately ſucceeds the ſenſation which excites it.

M. M. Cover the affected parts with a ſticking plaſter or a bliſter. Paſs a fine needle and thread through a part of the ſkin over the muſcle, which moves, and attach the other end of the thread by a ſticking plaſter to a diſtant part. An iſſue behind the ear. To practiſe daily by a looking-glaſs to ſtop the motions with the hand. See the cure of a caſe of the leaping of a muſcle of the arm, Sect. XVII. 1. 8. See Convulſio debilis, Claſs III. 1. 1. 5. Frequent electric ſparks, or very ſlight ſhocks.

3. *Riſus*

3. *Risus invitus.* Involuntary laughter. When the pleasure arising from new combinations of words and ideas, as in puns; or of other circumstances, which are so trivial, as to induce no voluntary exertion to compare or consider their present importance or their future consequence; the pleasure is liable to rise into pain; that is, the ideas or sensual motions become exerted too violently for want of some antithesistic ideas; in the same manner as those muscles, which have weak antagonists, as those of the calf of the leg, are liable to fall into cramp or painful contraction. In this situation a scream is begun to relieve this pain of ideas too violently exerted, which is stopped again soon, as explained in Sect. XXXIV. 1. 4. and Class III. 1. 1. 4. and IV. 2. 3. 3.

The pain, into which this pleasure rises, which would excite the scream of laughter, has been felt forcibly by every one; when they have been under such circumstances, as have induced them to restrain it by a counter-volition; till at length the increased associate motions produce so much pain as to overcome the counter-volition, and the patient bursts out into indecent laughter, contrary to his will in the common acceptation of that word.

4. *Lusus digitorum invitus.* An awkward playing with the fingers in speaking in public. These habits are begun through bashfulness, and seem rather

rather at firſt deſigned to engage the attention in part, and thus prevent the diſagreeable ideas of mauvaiſe honte; as timorous boys whiſtle, when they are obliged to walk in the dark; and as it is ſometimes neceſſary to employ raw ſoldiers in perpetual manœuvres, as they advance to the firſt charge.

5. *Unguium morſiuncula invita.* Biting the nails is a depraved habit ariſing from ſimilar cauſes as thoſe of the laſt article.

M. M. Dip the fingers in ſolution of aloes.

6. *Vigilia invita.* Watchfulneſs, where the perſon wiſhes and endeavours to fall aſleep, properly belongs to this place, as the wiſh or volition to ſleep prevents the deſired effect; becauſe ſleep conſiſts in an abolition of volition. See Claſs III. 1. 2. 3.

ORDO

ORDO I.

Increaſed Aſſociate Motions.

GENUS IV.

Catenated with External Influences.

SPECIES.

1. *Vita ovi.* Life of an egg. The eggs of fowls were ſhewn by Mr. J. Hunter to reſiſt the freezing proceſs in their living ſtate more powerfully, than when they were killed by having the yolk and white ſhook together. Philoſ. Tranſ. It may be aſked, does the heat during the incubation of eggs act as a ſtimulus exciting the living principle into activity? Or does it act ſimply as a cauſa ſine quâ non, as an influence, which penetrating the maſs, removes the particles of it to a greater diſtance from each other, ſo as to allow their movement over each other, in the ſame manner as heat is conceived to produce the fluidity of water; not by ſtimulus, but by its penetrating influence? Or may elementary heat in its uncombined ſtate be ſuppoſed to act only as an influence neceſſary to life in its natural quantity; whence torpor and death follow the eduction of it from the body; but in its increaſed ſtate above what is natural, or uſual, that it acts as a ſtimulus;

ſtimulus; which we have a ſenſe to perceive; and which excites many parts of the ſyſtem into unnatural action? See Claſs IV. 1. 1. C.

2. *Vita hiemi-dormientium.* The torpor of inſects, and birds, and quadrupeds, during the cold ſeaſon, has been called ſleep; but I ſuppoſe it muſt differ very much from that ſtate of animal life, ſince not only all voluntary power is ſuſpended, but ſenſation and vaſcular motion have ceaſed, and can only be reſtored by the influence of heat. There have been related inſtances of ſnails, which have recovered life and motion on being put into water after having experienced many years of torpidity, or apparent death, in the cabinets of the curious. Here the water as well as the heat are required not only as a ſtimulus, but as a cauſa ſine quâ non of fluidity and motion, and conſequent life.

3. *Pullulatio arborum.* The annual reviveſcence of the buds of trees ſeems not only to be owing to the influence of the returning warmth of the ſpring, but alſo to be catenated with ſolar gravitation; becauſe ſeeds and roots and buds, which are analogous to the eggs of animals, put forth their ſhoots by a leſs quantity of heat in ſpring, than they had undergone in the latter part of autumn, which may however be aſcribed to their previous torpid ſtate, and conſequent accumula-

tion

tion of ſenſorial power, or irritability; as explained in Botanic Garden, Part II. Cant. I. l. 322. note. Other circumſtances, which countenance the idea, that vegetation is affected by ſolar gravitation, as well as by heat, may be obſerved in the ripening of the ſeeds of plants both in thoſe countries where the ſummers are ſhort, and in thoſe where they are long. And by ſome flowers cloſing their bells at noon, or ſoon after; and hence ſeem to ſleep rather at ſolar diurnal periods, than from the influence of cold, or the deficiency of light.

4. *Orgaſmatis venerei periodus.* The venereal orgaſm of birds and quadrupeds commences or returns about the vernal or autumnal equinoxes, and thence ſeems in reſpect to their great periods to be governed by ſolar influence. But if this orgaſm be diſappointed of its object, it is ſaid to recur at about monthly periods, as obſerved in mares and bitches, in this reſpect reſembling the female catamenia. See Sect. XXXVI. 2. 3. and Sect. XVI. 13.

5. *Brachii concuſſio electrica.* The movement of the arm, even of a paralytic patient, when an electric ſhock is paſſed through it, is owing to the ſtimulus of the exceſs of electricity. When a piece of zinc and another of ſilver, each about the ſize of a crown-piece, are placed one under the upper lip, and

and the other on the tongue, ſo as the outer edges may be brought into contact, there is an appearance of light in the eyes, as often as the outer edges of theſe metals are brought into contact or ſeparated; which is another inſtance of the ſtimulus of the paſſage of electric ſhocks through the fibres of the organs of ſenſe, as well as through the muſcular fibres. See Sect. XII. 1. 1. But in its natural ſtate electricity ſeems only to act as an influence on animal and vegetable bodies; of the ſalutary or injurious effects of which we have yet no preciſe knowledge.

Yet if regular journals were kept of the variations of atmoſpheric electricity, it is probable ſome diſcoveries of its influence on our ſyſtem might in time be diſcovered. For this purpoſe a machine on the principle of Mr. Bennet's electric doubler might be applied to the pendulum of a clock, ſo as to manifeſt, and even to record the daily or hourly variations of aerial electricity. Which has already been executed, and applied to the pendulum of a Dutch wooden clock, by Mr. Bennet, curate of Wirkſworth in Derbyſhire.

Beſides the variations of the degree or kind of atmoſpheric electricity, ſome animals, and ſome men, ſeem to poſſeſs a greater power of accumulating this fluid in themſelves than others. Of which a famous hiſtory of a Ruſſian prince was lately publiſhed; who, during the clear and ſevere froſts of that country, could not move him-

ſelf

ſelf in bed without luminous corruſcations. Such may have been the caſe of thoſe people, who have been related to have taken fire ſpontaneouſly, and to have been reduced to aſhes. The electric concuſſion from the gymnotus electricus, and torpedo, are other inſtances of the power of the animal ſyſtem to accumulate electricity, as in theſe it is uſed as a weapon of defence, or for the purpoſe of taking their prey.

Some have believed that the accumulation or paſſage of the magnetic fluid might affect the animal ſyſtem, and have aſſerted that the application of a large magnet to an aching tooth has quickly effected a cure. If this experiment is again tried in odontalgia, or hemicrania, the painful membrane of the tooth or head ſhould be included between the ſouth and north poles of a horſe-ſhoe magnet, or between the contrary poles of two different magnets, that the magnetiſm may be accumulated on the torpid part.

6. *Oxygenatio ſanguinis.* The variation of the quantity of oxygen gas exiſting in the atmoſphere muſt affect all breathing animals; in its exceſs this too muſt be eſteemed a ſtimulus; but in its natural quantity would ſeem to act as an influence, or cauſe, without which animal life cannot exiſt even a minute. It is hoped that Dr. Beddoes's plan for a pneumatic infirmary, for the purpoſe

of

of putting this and various other airs to the teſt of experiment, will meet with public encouragement, and render conſumption, aſthma, cancer, and many diſeaſes conquerable, which at preſent prey with unremitted devaſtation on all orders and ages of mankind.

7. *Humectatio corporis.* Water, and probably the vapour of water diſſolved or diffuſed in the atmoſphere, unites by mechanical attraction with the unorganized cuticle, and ſoftens and enlarges it; as may be ſeen in the looſe and wrinkled ſkin of the hands of waſherwomen; the ſame probably occurs to the mucous membrane of the lungs in moiſt weather; and by thickening it increaſes the difficulty of reſpiration of ſome people, who are ſaid to be aſthmatical. So far water may be ſaid to act as an influx or influence, but when it is taken up by the mouths of the abſorbent ſyſtem, it muſt excite thoſe mouths into action, and then acts as a ſtimulus.

There appears from hence to be four methods by which animal bodies are penetrated by external things. 1. By their ſtimulus, which induces the abſorbent veſſels to imbibe them. 2. By mechanical attraction, as when water ſoftens the cuticle. 3. By chemical attraction, as when oxygen paſſes through the membranes of the air-veſſels of the lungs, and combines with the blood. And laſtly, by influx without me-

chanical attraction, chemical combination, or animal abſorption, as the univerſal fluids of heat, gravitation, electricity, magnetiſm, and perhaps of other ethereal fluids yet unknown.

ORDO

ORDO II.

Decreased Associate Motions.

GENUS I.

Catenated with irritative Motions.

As irritative muscular motions are attended with pain, when they are exerted too weakly, as well as when they are exerted too strongly; so irritative ideas become attended with sensation, when they are exerted too weakly, as well as when they are exerted too strongly. Which accounts for these ideas being attended with sensation in the various kinds of vertigo described below.

There is great difficulty in tracing the immediate cause of the deficiencies of action of some links of the associations of irritative motions; first, because the trains and tribes of motions, which compose these links, are so widely extended as to embrace almost the whole animal system; and secondly, because when the first link of an associated train of actions is exerted with too great energy, the second link by reverse sympathy may be affected with torpor. And then this second link may transmit, as it were, this torpor to a third link, and at the same time regain its own energy of action; and it is possible this third link may in like manner transmit its torpor to a

fourth, and thus regain its own natural quantity of motion.

I ſhall endeavour to explain this by an example taken from ſenſitive aſſociated motions, as the origin of their diſturbed actions is more eaſily detected. This morning I ſaw an elderly perſon, who had gradually loſt all the teeth in his upper jaw, and all of the under except three of the molares; the laſt of theſe was now looſe, and occaſionally painful; the fangs of which were almoſt naked, the gums being much waſted both within and without the jaw. He is a man of attentive obſervation, and aſſured me, that he had again and again noticed, that, when a pain commenced in the membranes of the alveolar proceſs of the upper jaw oppoſite to the looſe tooth in the under one (which had frequently occurred for ſeveral days paſt), the pain of the looſe tooth ceaſed. And that, when the pain afterwards extended to the ear and temple on that ſide, the pain in the membranes of the upper jaw ceaſed. In this caſe the membranes of the alveolar proceſs of the upper jaw became torpid, and conſequently painful, by their reverſe ſympathy with the too violent actions of the inflamed membranes of the looſe tooth; and then by a ſecondary ſympathy the membranes about the ear and temple became torpid, and painful; and thoſe of the alveolar proceſs of the upper jaw regained their natural quantity of action, and

ceaſed

ceaſed to be painful. A great many more nice and attentive obſervations are wanted to elucidate theſe curious circumſtances of aſſociation, which will be found to be of the greateſt importance in the cure of many diſeaſes, and lead us to the knowledge of fever.

SPECIES.

1. *Cutis frigida pranſorum.* Chillneſs after dinner frequently attends weak people, or thoſe who have been exhauſted by exerciſe; it ariſes from the great expenditure of the ſenſorial power on the organs of digeſtion, which are ſtimulated into violent action by the aliment; and the veſſels of the ſkin, which are aſſociated with them, become in ſome meaſure torpid by reverſe ſympathy; and a conſequent chillneſs ſucceeds with leſs abſorption of atmoſpheric moiſture. See the ſubſequent article.

2. *Pallor urinæ pranſorum.* The paleneſs of urine after a full meal is an inſtance of reverſe aſſociation; where the ſecondary part of a train of aſſociate motions acts with leſs energy in conſequence of the greater exertions of the primary part. After dinner the abſorbent veſſels of the ſtomach and inteſtines are ſtimulated into greater action, and drink up the newly taken aliment; while thoſe, which are ſpread in great number

on the neck of the bladder, abſorb leſs of the aqueous part of the urine than uſual, which is therefore diſcharged in a more dilute ſtate; and has been termed crude by ſome medical writers, but it only indicates, that ſo great a proportion of the ſenſorial power is expended on digeſtion and abſorption of the aliment, that other parts of the ſyſtem act for a time with leſs energy. See Claſs IV. 1. 1. 6.

3. *Pallor urinæ a frigore cutaneo.* There is a temporary diſchargc of pale water, and a diarrhœa, induced by expoſing the ſkin to the cold air; as is experienced by boys, who ſtrip themſelves before bathing. In this caſe the mouths of the cutaneous lymphatics become torpid by the ſubduction of their accuſtomed degree of heat, and thoſe of the bladder and inteſtines become torpid by direct ſympathy; whence leſs of the thinner part of the urinary ſecretion, and of the mucus of the inteſtines, is reabſorbed. See Sect. XXIX. 4. 6. This effect of ſuddenly cooling the ſkin by the aſperſion of cold water has been uſed with ſucceſs in coſtiveneſs, and has produced evacuations, when other means have failed. When young infants are afflicted with griping joined with coſtiveneſs, I have ſometimes directed them to be taken out of a warm bed, and carried about for a few minutes in a cool room, with almoſt inſtant relief.

4. *Pallor*

4. *Pallor ex ægritudine.* When ſickneſs of ſtomach firſt occurs, a paleneſs of the ſkin attends it; which is owing to the aſſociation or catenation between the capillaries of the ſtomach and the cutaneous ones; which at firſt act by direct ſympathy. But in a ſhort time there commences an accumulation of the ſenſorial power of aſſociation in the cutaneous capillaries during their ſtate of inactivity, and then the ſkin begins to glow, and ſweats break out, from the increaſed actions of the cutaneous glands or capillaries, which is now in reverſe ſympathy with thoſe of the ſtomach. So in continued fevers, when the ſtomach is totally torpid, which is known by the total averſion to ſolid food, the cutaneous capillaries are by reverſe ſympathy in a perpetual ſtate of increaſed activity, as appears from the heat of the ſkin.

5. *Dyſpnœa a balneo frigido.* The difficulty of breathing on going up to the middle in cold water is owing to the irritative aſſociation or catenation of the action of the extreme veſſels of the lungs with thoſe of the ſkin. So that when the latter are rendered torpid or inactive by the application of ſudden cold, the former become inactive at the ſame time, and retard the circulation of the blood through the lungs, for this difficulty of breathing cannot be owing to the preſſure of the water impeding the circulation downwards,

as it happens equally by a cold ſhower-bath, and is ſoon conquered by habitual immerſions. The capillaries of the ſkin are rendered torpid by the ſubduction of the ſtimulus of heat, and by the conſequent diminutions of the ſenſorial power of irritation. The capillaries of the lungs are rendered torpid by the diminution of the ſenſorial power of aſſociation, which is now excited in leſs quantity by the leſſened actions of the capillaries of the ſkin, with which they are catenated. So that at this time both the cutaneous and pulmonary capillaries are principally actuated, as far as they have any action, by the ſtimulus of the blood. But in a ſhort time the ſenſorial powers of irritation, and of aſſociation, become accumulated, and very energetic action of both theſe membranes ſucceeds. Which thus reſemble the cold and hot fit of an intermittent fever.

6. *Dyſpepſia a pedibus-frigidis.* When the feet are long cold, as in riding in cold and wet weather, ſome people are very liable to indigeſtion and conſequent heart-burn. The irritative motions of the ſtomach become torpid, and do their office of digeſtion imperfectly, in conſequence of their aſſociation with the torpid motions of the veſſels of the extremities. Fear, as it produces paleneſs and torpidity of the ſkin, frequently occaſions temporary indigeſtion in conſequence of this aſſociation of the veſſels of the

the ſkin with thoſe of the ſtomach; as riding in very bad roads will give flatulency and indigeſtion to timorous people.

A ſhort expoſure to cold air increaſes digeſtion, which is then owing to the reverſe ſympathy between the capillary veſſels of the ſkin, and of the ſtomach. Hence when the body is expoſed to cold air, within certain limits of time and quantity, a reverſe ſympathy of the ſtomach and the ſkin firſt occurs, and afterwards a direct ſympathy. In the former caſe the expenditure of ſenſorial power by the ſkin being leſſened, but not its production in the brain; the ſecond link of the aſſociation, viz. the ſtomach, acquires a greater ſhare of it. In the latter caſe, by the continuation of the deficient ſtimulus of heat, the torpor becomes extended to the brain itſelf, or to the trunks of the nerves; and univerſal inactivity follows.

7. *Tuſſis a pedibus frigidis.* On ſtanding with the feet in thawing ſnow, many people are liable to inceſſant coughing. From the torpidity of the abſorbent veſſels of the lungs, in conſequence of their irritative aſſociations with thoſe of the ſkin, they ceaſe to abſorb the ſaline part of the ſecreted mucus; and a cough is thus induced by the irritation of this ſaline ſecretion; which is ſimilar to that from the noſtrils in froſty weather, but differs in reſpect to its immediate cauſe; the

former

former being from affociation with a diftant part, and the latter from defect of the ftimulus of heat on the noftrils themfelves. See Catarrhus frigidus, Clafs I. 2. 3. 3.

8. *Tuffis hepatica.* The cough of inebriates, which attends the enlargement of the liver, or a chronical inflammation of its upper membrane, is fuppofed to be produced by the inconvenience the diaphragm fuffers from the compreffion or heat of the liver. It differs however effentially from that attending hepatitis, from its not being accompanied with fever. And is perhaps rather owing to irritative affociation, or reverfe fympathy, between the lungs and the liver. As occurs in fheep, which are liable to a perpetual dry cough, when the fluke-worm is preying on the fubftance of their livers. See Clafs II. 1. 1. 5.

M. M. From half a grain to a grain of opium twice a day. A drachm of mercurial ointment rubbed on the region of the liver every night for eight or ten times.

9. *Tuffis arthitica.* Gout-cough. I have feen a cough, which twice recurred at a few years diftance in the fame perfon, during his fits of the gout, with fuch pertinacity and violence as to refift venefection, opiates, bark, blifters, mucilages, and all the ufual methods employed in coughs. It was for a time fuppofed to be the hooping-cough,

cough, from the violence of the action of coughing; it continued two or three weeks, the patient never being able to sleep more than a few minutes at once during the whole time, and being propped up in bed with pillows night and day.

As no fever attended this violent cough, and but little expectoration, and that of a thin and frothy kind, I suspected the membrane of the lungs to be rather torpid than inflamed, and that the saline part of the mucus not being absorbed stimulated them into perpetual exertion. And lastly, that though the lungs are not sensible to cold and heat, and probably therefore less mobile, yet, as they are nevertheless liable to consent with the torpor of cold feet, as described in Species 6 of this Genus, I suspected this torpor of the lungs to succeed the gout in the feet, or to act a vicarious part for them.

10. *Vertigo rotatoria.* In the vertigo from circumgyration the irritative motions of vision are increased; which is evinced from the pleasure that children receive on being rocked in a cradle, or by swinging on a rope. For whenever sensation arises from the production of irritative motion with less energy than natural, it is of the disagreeable kind, as from cold or hunger; but when it arises from their production with greater energy than natural, if it be confined within certain

tain limits, it is of the pleafurable kind, as by warmth or wine. With thefe increafed irritative motions of vifion, I fuppofe thofe of the ftomach are performed with greater energy by direct fympathy; but when the rotatory motions, which produce this agreeable vertigo, are continued too long, or are too violent, ficknefs of the ftomach follows; which is owing to the decreafed action of that organ from its reverfe fympathy with the increafed actions of the organ of vifion. For the expenditure of fenforial power by the organ of vifion is always very great, as appears by the fize of the optic nerves; and is now fo much increafed as to deprive the next link of affociation of its due fhare. As mentioned in Species 6 of this Genus.

In the fame manner the undulations of water, or the motions of a fhip, at firft give pleafure by increafing the irritative motions belonging to the fenfe of vifion; but produce ficknefs at length by expending on one part of the affociated train of irritative actions too much of that fenforial power, which ufually ferved the whole of it; whence fome other parts of the train acquire too little of it, and perform their actions in confequence too feebly, and thence become attended with difagreeable fenfation.

It muft alfo be obferved, that when the irritative motions are ftimulated into unufual action, as in inebriation, they become fucceeded by fen-

ſation, either of the pleaſurable or painful kind; and thus a new link is introduced between the irritative motions thus excited, and thoſe which uſed to ſucceed them; whence the aſſociation is either diſſevered or much weakened, and thus the vomiting in ſea-ſickneſs occurs from the defect of the power of aſſociation, rather than from the general deficiency of ſenſorial power.

When a blind man turns round, or when one, who is not blind, revolves in the dark, a vertigo is produced belonging to the ſenſe of touch. A blind man balances himſelf by the ſenſe of touch, which being a leſs perfect means of determining ſmall quantities of deviation from the perpendicular, occaſions him to walk more carefully upright than thoſe, who balance themſelves by viſion. When he revolves, the irritative aſſociations of the muſcular motions, which were uſed to preſerve his perpendicularity, become diſordered by their new modes of ſucceſſive exertion; and he begins to fall. For his feet now touch the floor in manners or directions different from thoſe they have been accuſtomed to; and in conſequence he judges leſs perfectly of the ſituation of the parts of the floor in reſpect to that of his own body, and thus loſes his perpendicular attitude. This may be illuſtrated by the curious experiment of croſſing one finger over the next to it, and feeling a nut or bullet with the ends of them. When, if the eyes be cloſed, the nut or bullet appears

pears to be two, from the deception of the ſenſe of touch.

In this vertigo from gyration, both of the ſenſe of ſight, and of the ſenſe of touch, the primary link of the aſſociated irritative motions is increaſed in energy, and the ſecondary ones are increaſed at firſt by direct ſympathy; but after a time they become decreaſed by reverſe ſympathy with the primary link, owing to the exhauſtion of ſenſorial power in general, or to the power of aſſociation in particular; becauſe in the laſt caſe, either pleaſurable or painful ſenſation has been introduced between the links of a train of irritative motions, and has diſſevered, or much enfeebled them.

Dr. Smyth, in his Eſſay on Swinging in Pulmonary Conſumption, has obſerved, that ſwinging makes the pulſe ſlower. Dr. Ewart of Bath confirmed this obſervation both on himſelf and on Col. Cathcart, who was then hectic, and that even on ſhipboard, where ſome degree of vertigo might be ſuppoſed previouſly to exiſt. Dr. Currie of Liverpool not only confirmed this obſervation frequently on himſelf, when he was alſo phthiſical, but found that equitation had a ſimilar effect on him, uniformly retarding his pulſe. This curious circumſtance cannot ariſe from the general effect of exerciſe, or fatigue, as in thoſe caſes the pulſe becomes weaker and quicker; it muſt therefore be aſcribed to a degree

of vertigo, which attends all thofe modes of motion, which we are not perpetually accuftomed to.

Dr. Currie has further obferved, that "in cafes of great debility the voluntary mufcular exertion requifite in a fwing produces wearinefs, that is, increafes debility; and that in fuch inftances he had frequently noticed, that the diminution of the frequency of the pulfe did not take place, but the contrary." Thefe circumftances may thus be accounted for.

The links of affociation, which are effected in the vertigo occafioned by unufual motion, are the irritative motions of the fenfe of vifion, thofe of the ftomach, and thofe of the heart and arteries. When the irritative ideas of vifion are exerted with greater energy at the beginning of vertigo, a degree of fenfation is excited, which is of the pleafurable kind, as above mentioned; whence the affociated trains of irritative motions of the ftomach, and heart, and arteries, act at firft with greater energy, both by direct fympathy, and by the additional fenforial power of fenfation. Whence the pulfe of a confumptive patient becomes ftronger and confequently flower.

But if this vertigo becomes much greater in degree or duration, the firft link of this train of affociated irritative motions expends too much of the fenforial power, which was ufually employed on the whole train; and the motions of the ftomach

mach become in consequence exerted with less energy. This appears, because in this degree of vertigo sickness supervenes, as in sea-sickness, which has been shewn to be owing to less energetic action of the stomach. And the motions of the heart and arteries then become weaker, and in consequence more frequent, by their direct sympathy with the lessened actions of the stomach. See Supplement, I. 12. and Class II. 1. 6. 7. The general weakness from fatigue is owing to a similar cause, that is, to the too great expenditure of sensorial power in the increased actions of one part of the system, and the consequent deficiency of it in other parts, or in the whole.

The abatement of the heat of the skin in hectic fever by swinging, is not only owing to the increased ventilation of cool air, but to the reverse sympathy of the motions of the cutaneous capillaries with those of the heart and arteries; which occurs in all fevers with arterial debility, and a hot or dry skin. Hence during moderate swinging the action of the heart and arteries becomes stronger and slower, and the action of the capillaries, which was before too great, as appeared by the heat of the skin, is now lessened by their reverse sympathy with that of the heart and arteries. See Supplement, I. 8.

11. *Vertigo visualis.* Visual vertigo. The vertigo rotatoria described above, was induced by the rotation or undulation of external objects, and

and was attended with increaſed action of the primary link of the aſſociated motions belonging to viſion, and with conſequent pleaſure. The vertigo viſualis is owing to leſs perfect viſion, and is not accompanied with pleaſurable ſenſation. This frequently occurs in ſtrokes of the palſy, and is then ſucceeded by vomiting; it ſometimes precedes epileptic fits, and often attends thoſe, whoſe ſight begins to be impaired by age.

In this vertigo the irritative ideas of the apparent motions of objects are leſs diſtinct, and on that account are not ſucceeded by their uſual irritative aſſociations of motion; but excite our attention. Whence the objects appear to librate or circulate according to the motions of our heads, which is called dizzineſs; and we loſe the means of balancing ourſelves, or preſerving our perpendicularity, by viſion. So that in this vertigo the motions of the aſſociated organs are decreaſed by direct ſympathy with their primary link of irritation; as in the preceding caſe of ſea-ſickneſs they are decreaſed by reverſe ſympathy.

When vertigo affects people about fifty years of age, their ſight has generally been ſuddenly impaired; and from their leſs accurate viſion they do not ſoon enough perceive the apparent motions of objects; like a perſon in a room, the walls of which are ſtained with the uniform figures of lozenges, explained in Sect. XX. 1. This is generally aſcribed to indigeſtion; but it

ceaſes ſpontaneouſly, as the patient acquires the habit of balancing himſelf by leſs diſtinct objects.

A gentleman about 50 was ſeized with an uncommon degree of vertigo, ſo as to fall on the ground, and not to be able to turn his head, as he ſat up either in his chair or in his bed, and this continued eight or ten weeks. As he had many decayed teeth in his mouth, and the vertigo was preceded and ſometimes accompanied by pains on one ſide of his head, the diſeaſe of a tooth was ſuſpected to be the cauſe. And as his timidity was too great to admit the extraction of thoſe which were decayed; after the trial of cupping repeatedly, fomentations on his head, repeated bliſters, with valerian, Peruvian bark, muſk, opium, and variety of other medicines; mercurials were uſed, both externally and internally, with deſign to inflame the membranes of the teeth, and by that means to prevent the torpor of the action of the membranes about the temple, and parietal bone; which are catenated with the membranes of the teeth by irritative aſſociation, but not by ſenſitive aſſociation. The event was, that as ſoon as the gums became ſore with a ſlight ptyaliſm, the pains about the head and vertigo gradually diminiſhed, and during the ſoreneſs of his gums entirely ceaſed; but I believe recurred afterwards, though in leſs degree.

The idea of inflaming the membranes of the

teeth to produce increaſed ſenſation in them, and thus to prevent their irritative connexion with thoſe of the cranium, was taken from the treatment of triſmus, or locked jaw, by endeavouring to inflame the injured tendon; which is ſaid to prevent or to remove the ſpaſm of the muſcles of the jaw. See Claſs III. 1. 1. 13. and 15.

M. M. Emetics. Bliſters. Iſſues about the head. Extraction of decayed teeth. Slight ſalivation. Sorbentia. Incitantia. Galvaniſm.

A lady was ſuddenly ſeized with violent vertigo, ſo as to prevent her from walking ſafely acroſs the room, this was attended with conſiderable diminution of ſight; and after various evacuations, and other medicines, had been tried without cure, Mr. Volta's galvanic pillar was uſed, conſiſting of about 30 plates of ſilver, the diameter of about one inch and half, and as many zinc plates, with interpoſed circles of cloth moiſtened with brine. A wire connected with each end of this pillar was approached repeatedly to her temples, which were previouſly moiſtened with brine, and 100 galvanic ſhocks were daily paſſed through the optic nerves, which ſoon appeared to be of great advantage, and ſhe ſoon recovered, both from the vertigo and dimneſs of ſight.

12. *Vertigo ebrioſa.* Vertigo from intoxication is owing to the aſſociation of the irritative ideas

of vision with the irritative motions of the stomach. Whence when these latter become much increased by the immoderate stimulus of wine, the irritative motions of the retina are produced with less energy by reverse sympathy, and become at the same time succeeded by sensation in consequence of their decreased action. See Sect. XXI. 3. and XXXV. 1. 2. So conversely when the irritative motions of vision are increased by turning round, or by our unaccustomed agitation at sea, those of the stomach become inverted by reverse sympathy, and are attended in consequence with disagreeable sensation. Which decreased action of the stomach is in consequence of the increased expenditure of the sensorial power on the irritative ideas of vision, as explained in Vertigo rotatoria.

Whence though a certain quantity of vinous spirit stimulates the whole system into increased action, and perhaps even increases the secretion of sensorial power in the brain; yet as soon as any degree of vertigo is produced, it is a proof, that by the too great expenditure of sensorial power by the stomach, and its nearest associated motions, the more distant ones, as those of vision, become imperfectly exerted. From hence may be deduced the necessity of exhibiting wine in fevers with weak pulse in only appropriated quantity; because if the least intoxication be induced, some part of the system must act more feebly

feebly from the unneceſſary expenditure of ſenſorial power.

13. *Vertigo febriculoſa.* Vertigo in fevers either proceeds from the general deficiency of ſenſorial power belonging to the irritative aſſociations, or to a greater expenditure of it on ſome links of the trains and tribes of aſſociated irritative motions. There is however a ſlighter vertigo attending all people, who have been long confined in bed, on their firſt riſing; owing to their having been ſo long unuſed to the apparent motions of objects in their erect poſture, or as they paſs by them, that they have loſt in part the habit of balancing themſelves by them.

14. *Vertigo cerebroſa.* Vertigo from injuries of the brain, either from external violence, or which attend paralytic attacks, are owing to the general deficiency of ſenſorial power. In theſe diſtreſsful ſituations the vital motions, or thoſe immediately neceſſary to life, claim their ſhare of ſenſorial power in the firſt place, otherwiſe the patient muſt die; and thoſe motions, which are leſs neceſſary, feel a deficiency of it, as theſe of the organs of ſenſe and muſcles; which conſtitute vertigo; and laſtly the voluntary motions, which are ſtill leſs immediately neceſſary to life, are frequently partially deſtroyed, as in palſy; or totally, as in apoplexy.

15. *Murmur aurium vertiginosum.* The vertiginous murmur in the ears, or noise in the head, is compared to the undulations of the sound of bells, or to the humming of bees. It frequently attends people about 60 years of age; and like the visual vertigo described above is owing to our hearing less perfectly from the gradual inirritability of the organ on the approach of age; and the disagreeable sensation of noise attending it is owing to the less energetic action of these irritative motions; which not being sufficiently distinct to excite their usual associations become succeeded by our attention, like the indistinct view of the apparent motions of objects mentioned in vertigo visualis. This may be better understood from considering the use, which blind men make of these irritative sounds, which they have taught themselves to attend to, but which escape the notice of others. The late blind Justice Fielding walked for the first time into my room, when he once visited me, and after speaking a few words said, "This room is about 22 feet long, 18 wide, and 12 high;" all which he guessed by the ear with great accuracy. Now if these irritative sounds from the partial loss of hearing do not correspond with the size or usual echoes of the places, where we are; their catenation with other irritative ideas, as those of vision, becomes dissevered or disturbed; and we attend to them in consequence, which I think unravels this intricate circumstance

circumſtance of noiſes being always heard in the head, when the ſenſe of hearing begins to be impaired, from whatever cauſe it occurs.

This ringing in the ears alſo attends the vertigo from intoxication; for the irritative ideas of ſound are then more weakly excited in conſequence of the deficiency of the ſenſorial power of aſſociation. As is known by this alſo being attended with diſagreeable ſenſation, and by its accompanying other diſeaſes of debility, as ſtrokes on the head, fainting fits, and paralytic ſeizures. For in this vertigo from intoxication ſo much ſenſorial power in general is expended on the increaſed actions of the ſtomach, and its neareſt connections, as the capillaries of the ſkin; that there is a deficiency for the purpoſes of the other irritative aſſociations of motions uſually connected with it. This auditory vertigo attends both the rotatory and the viſual vertigo above-mentioned; in the former it is introduced by reverſe ſympathy, that is, by the diminution of ſenſorial power; too great a quantity of it being expended on the increaſed irritative motions of viſion; in the latter it is produced either by the ſame cauſes which produce the viſual vertigo, or by direct ſympathy with it. See Sect. XX. 7.

M. M. Stimulate the internal ear by ether, or with eſſential oil diluted with expreſſed oil, or with a ſolution of opium in wine, or in water.

Or with ſalt and water. Apply a cupping glaſs over the ear. See I. 2. 5. 6. Galvanic ſhocks through the temples. See IV. 2. 1. 11.

16. *Tactus, guſtus, olfactus vertiginoſi.* Vertiginous touch, taſte, and ſmell. In the vertigo of intoxication, when the patient lies down in bed, it ſometimes happens even in the dark, that the bed ſeems to librate under him, and he is afraid of falling out of it. The ſame occurs to people, who are ſea-ſick, even when they lie down in the dark. In theſe the irritative motions of the nerves of touch, or irritative tangible ideas, are performed with leſs energy, in one caſe by reverſe ſympathy with the ſtomach, in the other by reverſe ſympathy with the nerves of viſion, and in conſequence become attended with ſenſation, and produce the fear of falling by other aſſociations.

A vertigo of the ſenſe of touch may be produced, if any one turns round for a time with his eyes ſhut, and ſuddenly ſtops without opening them; for he will for a time ſeem to be ſtill going forwards; which is difficult to explain. See Sect. XX. 6.

In the beginning of ſome fevers, along with inceſſant vomiting, the patients complain of diſagreeable taſtes in their mouth, and diſagreeable odours; which are to be aſcribed to the general debility

debility of the great trains and tribes of aſſociated irritative motions, and to be explained from their direct ſympathy with the decreaſed action of a ſick ſtomach; or from the leſs ſecretion of ſenſorial power in the brain. Theſe organs of ſenſe are conſtantly ſtimulated into action by the ſaliva or by the air; hence, like the ſenſe of hunger, when they are torpid from want of ſtimulus, or from want of ſenſorial power, pain or diſagreeable ſenſation enſues, as of hunger, or faintneſs, or ſickneſs in one caſe; and the ideas of bad taſtes or odours in the other. This accords with the laws of cauſation, Sect. IV. 5.

17. *Pulſus mollis in vomitione.* The ſoftneſs of the pulſe in the act of vomiting is cauſed by direct aſſociation between the heart and the ſtomach; as explained in Sect. XXV. 17. A great ſlowneſs of the pulſation of the heart ſometimes attends ſickneſs, and even with intermiſſions of it, as in the exhibition of too great a doſe of digitalis.

18. *Pulſus intermittens a ventriculo.* When the pulſe firſt begins to intermit, it is common for the patient to bring up a little air from his ſtomach; which if he accompliſhes before the intermiſſion occurs, always prevents it; whence that this debility of the heart is owing to the direct

rect aſſociation of its motions with thoſe of the ſtomach is well evinced. See Sect. XXV. 17.

I this morning ſaw Mr. ——, who has long had at times an unequal pulſe, with indigeſtion and flatulency, and occaſional aſthma; he was ſeized two days ago with diarrhœa, and this morning with ſickneſs, and his pulſe was every way unequal. After an emetic his pulſe ſtill continued very intermittent and unequal. He then took ſome breakfaſt of toaſt and butter, and tea, and to my great ſurpriſe his pulſe became immediately perfectly regular, about 100 in a minute, and not weak, by this ſtimulus on his ſtomach.

A perſon, who for many years had had a frequent intermiſſion of his pulſe, and occaſional palpitation of his heart, was relieved from them both for a time by taking about four drops of a ſaturated ſolution of arſenic three or four times a day for three or four days. As this intermiſſion of the pulſe is occaſioned by the direct aſſociation of the motions of the heart with thoſe of the ſtomach, the indication of cure muſt be to ſtrengthen the action of the ſtomach by the bark. Spice. Moderate quantities of wine. A bliſter. Half a grain of opium twice a day. Solution of arſenic?

19. *Febris inirritativa.* Inirritative fever deſcribed in Claſs I. 2. 1. 1. belongs to this place, as

as it consists of disordered trains and tribes of associated irritative motions, with lessened actions of the associated organs. In this fever the pulsations of the heart and arteries are weakened or lessened, not only in the cold paroxysm, as in the irritative fever, but also in the hot paroxysm. The capillary arteries or glands have their actions nevertheless increased after the first cold fit, as appears by the greater production of heat, and the glow of arterial blood in the cutaneous vessels; and lastly, the action of the stomach is much impaired or destroyed, as appears by the total want of appetite to solid food. Whence it would seem, that the torpid motions of the stomach, whatever may occasion them, are a very frequent cause of continued fever with weak pulse; and that these torpid motions of the stomach do not sufficiently excite the sensorial power of association, which contributes in health to actuate the heart and arteries along with the irritation produced by the stimulus of the blood; and hence the actions of these organs are weaker. And lastly, that the accumulation of the sensorial power of association, which ought to be expended on the motions of the heart and arteries, becomes now exerted on the cutaneous and pulmonary capillaries. See Supplement I. 8. and Sect. XXXV. 1. 1. and XXXIII. 2. 10.

I have dwelt longer on the vertiginous diseases

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in this genus, both becauſe of their great intricacy, and becauſe they ſeem to open a road to the knowlege of fever, which conſiſts of aſſociated trains and tribes of irritative or ſenſitive motions, which are ſometimes mixed with the vertiginous ones, and ſometimes ſeparate from them.

ORDO

ORDO II.

Decreaſed Aſſociate Motions.

GENUS II.

Catenated with Senſitive Motions.

IN this genus the ſenſorial power of aſſociation is exerted with leſs energy, and thence the actions produced by it are leſs than natural; and pain is produced in conſequence, according to the fifth law of animal cauſation, Sect. IV. This pain is generally attended with coldneſs of the affected part, and is ſeldom ſucceeded by inflammation of it. This decreaſed action of the ſecondary link of the aſſociated motions, belonging to this genus, is owing to the previous exhauſtion of ſenſorial power either in the increaſed actions of the primary link of the aſſociated motions, or by the pain which attends them; both which are frequently the conſequence of the ſtimulus of ſomething external to the affected fibres.

As pain is produced either by exceſs or defect of the natural exertions of the fibres, it is not, conſidered ſeparately, a criterion of the preſence of either. In the aſſociations belonging to this genus the ſenſation of pain or pleaſure produces or attends the primary link of the aſſociated motions, and very often gives name to the diſeaſe.

When great pain exiſts without cauſing any fibrous

fibrous motions, I conjecture that it contributes to exhauſt or expend the general quantity of ſenſorial power; becauſe people are fatigued by enduring pain, till at length they ſleep. Which is contrary to what I had perhaps erroneouſly ſuppoſed in Sect. XXXV. 2. 3. If it cauſes fibrous motions, it then takes the name of ſenſation, according to the definition of ſenſation in Sect. II. 2. 9.; and increaſed fibrous action or inflammation is the conſequence. This circumſtance of the general exhauſtion of ſenſorial power by the exiſtence of pain will aſſiſt in explaining many of the diſeaſes of this genus.

Many of the canals of the body, as the urethra, the bile-duct, the throat, have the motions of their two extremities aſſociated by having been accuſtomed to feel pleaſurable or painful ſenſations at the ſame time or in ſucceſſion. This is termed ſenſitive aſſociation, though thoſe painful or pleaſurable ſenſations do not cauſe the motions, but only attend them; and are thus perhaps, ſtrictly ſpeaking, only catenated with them.

SPECIES.

1. *Torpor genæ a dolore dentis.* In tooth-ach there is generally a coldneſs of the cheek, which is ſenſible to the hand, and is attended in ſome degree with the pain of cold. The cheek and tooth have frequently been engaged in pleaſurable action at the ſame time during the maſticating of

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our food; whence they have acquired ſenſitive aſſociations. The torpor of the cheek may have for its cauſe the too great expenditure of ſenſorial power by the painful ſenſation of the membranes of the diſeaſed tooth; whence the membranes of the cheek aſſociated with thoſe of the alveolar proceſs are deprived of their natural ſhare of it, and become torpid; thus they produce leſs ſecretions, and leſs heat, and the pain of cold is the conſequence. This torpor of the veſſels of the cheek cannot be produced by the activity of the ſenſorial power of ſenſation; for then they would act more violently than natural, or become inflamed. And though the pain by exhauſting ſo much ſenſorial power may be a remote cauſe, it is the defect of the power of aſſociation, which is the immediate cauſe of the torpor of the cheek.

After ſome hours this pain occaſioned by the torpor of the veſſels of the cheek either gradually ceaſes along with the pain of the diſeaſed tooth; or, by the accumulation of ſenſorial power during their ſtate of torpor, the capillaries of the cheek act with greater violence, and produce more ſecretions, and heat, and conſequent tumour, and inflammation. In this ſtate the pain of the diſeaſed tooth ceaſes; as the ſenſorial power of ſenſation is now expended on the inflamed veſſels of the cheek. It is probable that moſt other internal membranous inflammations begin in a ſimilar manner; whence there may

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ſeem to be a double kind of ſenſitive aſſociation; firſt, with decreaſed action of the aſſociated organ, and then with increaſed action of it; but the latter is in this caſe ſimply the conſequence of the former; that is, the tumour or inflammation of the cheek is in conſequence of its previous quieſcence or torpor.

2. *Stranguria a dolore veſicæ.* The ſtrangury, which has its origin from pain at the neck of the bladder, conſiſts of a pain in the external extremity of the urethra or of the glans penis of men, and probably in the external termination of the urethra or of the clitoris of women; and is owing to the ſympathy of theſe with ſome diſtant parts, generally with the other end of the urethra; an endeavour and difficulty of making water attends this pain.

Its remote cauſe is from the internal or external uſe of cantharides, which ſtimulate the neck of the bladder; or from a ſtone, which whenever it is puſhed into the neck of the bladder, gives this pain of ſtrangury, but not at other times; and hence it is felt moſt ſeverely in this caſe after having made water.

The ſenſations or ſenſitive motions of the glans penis, and of the ſphincter of the bladder, have been accuſtomed to exiſt together during the diſcharge of the urine; and hence the two ends of the urethra ſympathize by aſſociation. When

there is a ſtone at the neck of the bladder, which is not ſo large or rough as to inflame the part, the ſphincter of the bladder becomes ſtimulated into pain; but as the glans penis is for the purpoſes of copulation more ſenſitive than the ſphincter of the bladder, as ſoon as it becomes affected with pain by the aſſociation above mentioned, the ſenſation at the neck of the bladder ceaſes; and then the pain of the glans penis would ſeem to be aſſociated with the irritative motions only of the ſphincter of the bladder, and not with the ſenſitive ones of it. But a circumſtance ſimilar to this occurs in epileptic fits, which at firſt are induced by diſagreeable ſenſation, and afterwards ſeem to occur without previous pain, from the ſuddenneſs with which they follow and relieve the pain, which occaſioned them. From this analogy I imagine the pain of the glans penis is aſſociated with the pain of the ſphincter of the bladder; but that *as ſoon as the greater pain in a more ſenſible part is produced; the leſs pain, which occaſioned it, ceaſes*; and that this is one of the laws of ſenſitive aſſociation. See Sect. XXXV. 2. 1.

A young man had by an accident ſwallowed a large ſpoonful or more of tincture of cantharides; as ſoon as he began to feel the pain of ſtrangury, he was adviſed to drink large quantities of warmiſh water: to which, as ſoon as it could be gotten, ſome gum arabic was added. In an hour or two he drank by intervals of a few minutes about two gallons of water, and diſcharged

his urine every four or five minutes. A little blood was voided towards the end, but he suffered no ill consequence.

M. M. Warm water internally. Clysters of warm water. Fomentation. Opium. Solution of fixed alkali supersaturated with carbonic acid. A bougie may be used to push back a stone into the bladder. See Class I. 1. 3. 10.

3. *Stranguria convulsiva.* The convulsive strangury, like that before described, is probably occasioned by the torpor or defective action of the painful part in consequence of the too great expenditure of sensorial power on the primary link of the associated motions, as no heat or inflammation attends this violent pain. This kind of strangury recurs by stated periods, and sometimes arises to so great a degree, that convulsion or temporary madness terminates each period of it. It affects women oftener than men, is attended with cold extremities without fever, and is distinguished from the stone of the bladder by the regularity of its periods, and by the pain being not increased after making water.

On introducing the catheter sometimes part of the urine will come away and not the whole, which is difficult to explain; but may arise from the weakness of the muscular fibres of the bladder; which are not liable suddenly to contract themselves so far as to exclude the whole of the

the urine. In ſome old people, who have experienced a long retention of urine, the bladder never regains the power of completely emptying itſelf; and many who are beginning to be weak from age can make water a ſecond time, a few minutes after they ſuppoſed they had emptied the bladder.

I have believed this pain to originate from ſympathy with ſome diſtant part, as from aſcarides in the rectum, or from piles in women; or from caruncles in the urethra about the caput gallinaginis in men; and that the pain has been in the glans or clitoris by reverſe ſympathy of theſe more ſenſible parts with thoſe above mentioned.

M. M. Veneſection. Opium in large quantities. Warm bath. Balſams. Bark. Tincture of cantharides. Bougie, and the treatment for hæmorrhoids. Leeches applied to the ſphincter ani. Aerated alcaline water. Soap and ſal ſoda. Opium in clyſters given an hour before the expected return. Smoke of tobacco in clyſters. Arſenic.

4. *Dolor termini inteſtinalis ductûs choledochi.* Pain at the inteſtinal end of the gall-duct. When a gall-ſtone is protruded from the gall-bladder a little way into the end of the gall-duct, the pain is felt at the other end of the gall-duct, which terminates in the duodenum. For the actions of the two terminations of this canal are aſ-

ſociated together from the ſame ſtreams of bile paſſing through them in ſucceſſion, exactly as the two terminations of the urethra have their actions aſſociated, as deſcribed in Species 2 and 3 of this genus. But as the inteſtinal termination of the bile-duct is made more ſenſible for the purpoſe of bringing down more bile, when it is ſtimulated by new ſupplies of food from the ſtomach, it falls into violent pain from aſſociation; and then the pain on the region of the gall-bladder ceaſes, exactly as above explained in the account of the pain of the glans penis from a ſtone in the ſphincter of the bladder.

The common bile-duct opens into the inteſtine exactly at what is called the pit of the ſtomach; and hence it has ſometimes happened, that this pain from aſſociation with the ſenſation of a gall-ſtone at the other end of the bile-duct has been miſtaken for a pain of the ſtomach.

For the method of cure ſee Claſs I. 1. 3. 8. to which ſhould be added the uſe of ſtrong electric ſhocks paſſed through the bile-duct from the pit of the ſtomach to the back, and from one ſide to the other. A caſe of the good effect of electricity in the jaundice is related in Sect. XXX. 2. And another caſe, where it promoted the paſſage of a painful gall-ſtone, is deſcribed by Dr. Hall, experienced on himſelf. Tranſ. of the College at Philadelphia, Vol. I. p. 192.

Half a pint of warm water two or three times

a day is much recommended to dilute the inſpiſſated bile.

5. *Dolor pharyngis ab acido gaſtrico.* The two ends of the throat ſympathize by ſenſitive aſſociation in the ſame manner as the other canals above mentioned, namely, the urethra and the bile-duct; hence when too great acidity of undigeſted aliment, or the carbonic acid air, which eſcapes in fermentation, ſtimulates the cardia ventriculi, or lower end of the gula, into pain, the pharynx, or upper end of it, is affected with greater pain, or a diſagreeable ſenſation of heat.

6. *Pruritus narium a vermibus.* The itching of the noſe from worms in the inteſtines is another curious inſtance of the ſenſitive aſſociations of the motions of membranes; eſpecially of thoſe which conſtitute the canals of the body. Previous to the deglutition of agreeable food, as milk in our earlieſt infancy, an agreeable odour affects the membrane, which lines the noſtrils; and hence an aſſociation ſeems to take place between the agreeable ſenſations produced by food in the ſtomach and bowels, and the agreeable ſenſations of the noſtrils. The exiſtence of aſcarides in the rectum I believe produces this itching of the noſtrils more than the worms in other parts of the inteſtines; as we have already ſeen, that the terminations of canals ſympathize more

than their other parts, as in the urethra and gall-ducts. See Claſs I. 1. 5. 9. IV. 1. 2. 9.

7. *Cephalæa ſympathetica.* Sympathetic head-ach. In cold fits of the ague, the head-ach ariſes from conſent with ſome torpid viſcus, like the pain of the loins. After drunkenneſs the head-ach is very common, owing to direct ſympathy of the membranes of the head with thoſe of the ſtomach; which is become torpid after the too violent ſtimulus of the preceding intoxication; and is hence removable by ſpirit of wine, or opium, exhibited in ſmaller quantities. In ſome conſtitutions theſe head-achs are induced, when the feet are expoſed to much external cold; in this caſe the feet ſhould be covered with oiled ſilk, which prevents the evaporation of the perſpirable matter, and thence diminiſhes one cauſe of external cold.

M. M. Valerian in powder two drams three or four times a day is recommended. The bark. Chalybeates. A grain of opium twice a day for a long time. From five to ten drops of the ſaturated ſolution of arſenic two or three times a day. See Claſs I. 2. 4. 11. A lady once aſſured me, that when her head-ach was coming on, ſhe drank three pints (pounds) of hot water, as haſtily as ſhe could; which prevented the progreſs of the diſeaſe. A ſolution of arſenic is recommend-

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ed by Dr. Fowler of York. Very ſtrong errhines are ſaid ſometimes to cure head-aehs taken at the times the pain recurs, till a few drops of blood iſſue from the noſtrils. As one grain of turpeth mineral (vitriolic calx of mercury) mixed with ten grains of fine ſugar. Euphorbium or cayenne pepper mixed with ſugar, and uſed with caution as an errhine. See the M. M. of the next Species.

8. *Hemicrania ſympathetica.* Sympathetic pain on one ſide of the head. This diſeaſe is attended with cold ſkin, and hence whatever may be the remote cauſe, the immediate one ſeems to be want of ſtimulus, either of heat or diſtention, or of ſome other unknown ſtimulus in the painful part; or in thoſe, with whieh it is aſſociated. The membranes in their natural ſtate are only irritable by diſtention; in their diſeaſed ſtate, they are ſenſible like muſcular fibres. Hence a diſeaſed tooth may render the neighbouring membranes ſenſible, and is frequently the cauſe of this diſeaſe.

Sometimes the ſtomach is torpid along with the pained membrane of the head; and then ſicknefs and inappeteney attend either as cauſes or conſequences. The natural cure of hemicrania is the accumulation of ſenſorial power during the reſt or ſicknefs of the patient. Mrs. ——— is frequently liable to hemicrania with ſicknefs,

which is probably owing to a diſeaſed tooth; the paroxyſm occurs irregularly, but always after ſome previous fatigue, or other cauſe of debility. She lies in bed, ſick, and without taking any ſolid food, and very little of fluids, and thoſe of the aqueous kind, and, after about 48 or 50 hours, riſes free from complaint. Similar to this is the recovery from cold paroxyſms of fever, from the torpor occaſioned by fear, and from ſyncope; which are all owing to the accumulation of ſenſorial power during the inactivity of the ſyſtem. Hence it appears, that, though when the ſenſorial power of volition is much exhauſted by fatigue, it can be reſtored by eight or ten hours of ſleep; yet, when the ſenſorial power of irritation is exhauſted by fatigue, that it requires two whole ſolar or lunar days of reſt, before it can be reſtored.

The late Dr. Monro aſſerted in his lectures, that he cured the hemicrania, or megrim, by a ſtrong vomit, and a briſk purge immediately after it. This method ſucceeds beſt if opium and the bark are given in due quantity after the operation of the cathartic; and with ſtill more certainty, if bleeding in ſmall quantity is premiſed, where the pulſe will admit of it. See Sect. XXXV. 2. 1.

Mr. Kellie aſſerts, that ſome kinds of headachs, eſpecially thoſe which ariſe from defect of ſtimulation, may be cured by compreſſing the two ſubclavian arteries, as they paſs over the firſt rib; which he thinks would produce a preſ-

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ſure on the brain ſimilar to that, which may be produced by the centrifugal force, if a perſon was to lie acroſs a mill-ſtone as it revolves. See Suppl. I. 15. 7. Would ſuch a circulating bed remove any kind of head-ach?

The pain generally affects one eye, and ſpreads a little way on that ſide of the noſe, and may ſometimes be relieved by preſſing or cutting the nerve, where it paſſes into the bone of the orbit above the eye. When it affects a ſmall defined part on the parietal bone on one ſide, it is generally termed Clavus hyſtericus, and is always I believe owing to a diſeaſed dens molaris. The tendons of the muſcles, which ſerve the office of maſtication, have been extended into pain at the ſame time that the membranous coverings of the roots of the teeth have been compreſſed into pain, during the biting or maſtication of hard bodies. Hence when the membranes, which cover the roots of the teeth, become affected with pain by a beginning decay, or perhaps by the torpor or coldneſs of the dying part of the tooth, the tendons and membranous faſcia of the muſcles about the ſame ſide of the head become affected with violent pain by their ſenſitive aſſociations: and as ſoon as this aſſociated pain takes place, the pain of the tooth entirely ceaſes, as explained in the ſecond ſpecies of this genus.

A remarkable circumſtance attends this kind of hemicrania, viz. that it recurs by periods like thoſe of intermittent fevers, as explained in the

Section

Section on Catenation of Motions; these periods sometimes correspond with alternate lunar or solar days like tertian agues, and that even when a decaying tooth is evidently the cause; which has been evinced by the cure of the disease by extracting the tooth. At other times they observe the monthly lunations, and seem to be induced by the debility, which attends menstruation.

The dens sapientiæ, or last tooth of the upper jaw, frequently decays first, and gives hemicrania over the eye on the same side. The first or second grinder in the under-jaw is liable to give violent pain about the middle of the parietal bone, or side of the head, on the same side, which is generally called the Clavus hystericus, of which an instructive case is related in Sect. XXXV. 2. 1.

Since the above was first published I have seen two cases, which were very similar, and seem much to confirm the above theory of sympathetic hemicrania being perhaps always owing to the sympathy of the membranes about the cranium with those about diseased teeth. Lord M. and Mr. B. of Edinburgh, both of them about the middle of life were afflicted with violent hemicrania for about two years; in the beginning of which time they both assured me, that their teeth were perfectly sound, but on inspecting their mouths I found all the molares were now so decayed as to have lost their crowns. After having suffered pain for sixteen or eighteen months

months almoſt inceſſantly in different parts of their heads, they had each of them a hemiplegia, from which they gradually recovered, as much as paralytic affections generally do recover. All the ſtumps of their teeth, which were uſeleſs, were directed to be extracted; as the ſwallowing ſo much putrid matter from decaying bones ſeemed to injure their digeſtion. They were deſired not to drink wine or ale without its being diluted with twice or thrice its quantity of water, to prevent any acceſs of torpor from too great previous ſtimulus, and to take ſix grains of rhubarb with three of ſoap made into pills, every night, with ſome bitter and very ſlight chalybeate medicines. If the teeth which became torpid in ſucceſſion, could have been diſcovered, and extracted, before they decayed, and could have been replaced, might not this continuance of pain, and conſequent paralyſis, have been prevented? or might not a moderate ſalivation have effected this purpoſe?

M. M. Detect and extract the diſeaſed tooth. Cut the affected nerve, or ſtimulate the diſeaſed membrane by acupuncture. Veneſection to ſix ounces by the lancet or by leeches. A ſtrong emetic and a ſubſequent cathartic; and then an opiate and the bark. Paſs ſmall electric ſhocks through the pained membrane, and through the teeth on the ſame ſide. Apply vitriolic ether externally, and a grain of opium with camphor internally, to the cheek on the affected ſide, where a diſeaſed

a diſeaſed tooth may be ſuſpected. Foment the head with warm vinegar. Drink two large ſpoonfuls of vinegar. Stimulate the gums of the ſuſpected teeth by oil of cloves, by opium. See Claſs I. 1. 4. 4. Snuff volatile ſpirit of vinegar up the noſtrils. Laſtly, in permanent head-achs, as in permanent vertigo, I have ſeen good effect in two caſes by the uſe of mercurial ointment rubbed on the ſhaved head or about the throat, till a mild ſalivation commences, which by inflaming the membranes of the teeth may prevent their irritative ſympathy with thoſe of the cranium. Thus by inflaming the tendon, which is the cauſe of locked jaw, and probably by inflaming the wound, which is the cauſe of hydrophobia, thoſe diſeaſes may be cured, by diſuniting the irritative ſympathy between thoſe parts, which may not poſſeſs any ſenſitive ſympathy. This idea is well worth our attention.

Otalgia. Ear-ach is another diſeaſe occaſioned by the ſympathy of the membranes of the ear with thoſe which inveſt or ſurround a decaying tooth, as I have had frequent reaſon to believe; and is frequently relieved by filling the ear with tincture of opium. See Claſs I. 2. 4.

9. *Dolor humeri in hepatidide.* In the efforts of excluding the fæces and urine the muſcles of the ſhoulders are exerted to compreſs the air in the lungs, that the diaphragm may be preſſed down.

Hence

Hence the diſtention of the tendons or fibres of theſe muſcles is aſſociated with the diſtention of the tendons or fibres of the diaphragm; and when the latter are pained by the enlargement or heat of the inflamed liver, the former ſympathize with them. Sometimes but one ſhoulder is affected, ſometimes both; it is probable that many other pains, which are termed rheumatic, have a ſimilar origin, viz. from ſenſitive aſſociations.

As no inflammation is produced in conſequence of this pain of the ſhoulder, it ſeems to be owing to inaction of the membranous part from defect of the ſenſorial power of aſſociation, of which the primary link is the inflamed membrane of the liver; which now expends ſo much of the ſenſorial power in general by its increaſed action, that the membranes about the ſhoulder, which are links of aſſociation with it, become deprived of their uſual ſhare, and conſequently fall into torpor.

10. *Torpor pedum in eruptione variolarum.* At the commencement of the eruption of the ſmall-pox, when the face and breaſt of children are very hot, their extremities are frequently cold. This I aſcribe to ſenſitive aſſociation between the different parts of the ſkin; whence when a part acts too violently, the other part is liable to act too weakly; and the ſkin of the face being affected

ed firſt in the eruption of the ſmall-pox, the ſkin of the feet becomes cold in conſequence by reverſe ſympathy.

M. M. Cover the feet with flannel, and expoſe the face and boſom to cool air, which in a very ſhort time both warms the feet and cools the face; and hence what is erroneouſly called a raſh, but which is probably a too haſty eruption of the ſmall-pox, diſappears; and afterwards fewer and more diſtinct eruptions of the ſmall-pox ſupervene.

11. *Teſtium dolor nephriticus.* The pain and retraction of the teſticle on the ſame ſide, when there is a ſtone in the ureter, is to be aſcribed to ſenſitive aſſociation; whether the connecting cauſe be a branch of the ſame nerve, or from membranes, which have been frequently affected at the ſame time.

12. *Dolor digiti minimi ſympatheticus.* When any one accidentally ſtrikes his elbow againſt any hard body, a tingling pain runs down to the little finger end. This is owing to ſenſitive aſſociation of motions by means of the ſame branch of a nerve, as in hemicrania from a decaying tooth the pain is owing to the ſenſitive aſſociation of tendons or membranes.

13. *Dolor brachii in hydrope pectoris.* The pain in

in the left arm which attends ſome dropſies of the cheſt, is explained in Sect. XXIX. 5. 2. 10. which reſembles the pain of the little finger from a percuſſion of the nerve at the elbow in the preceding article. A numbneſs of this kind produced over the whole leg, when the crural nerve is much compreſſed by ſitting for a time with one leg croſſed over the other.

Mr. ———, about ſixty, had for two years been affected with difficulty of reſpiration on any exertion, with pain about the ſternum, and of his left arm; which laſt was more conſiderable than is uſual in dropſy of the cheſt; ſome months ago the pain of his arm, after walking a mile or two, became exceſſive, with coldneſs and numbneſs; and on the next day the back of the hand, and a part of the arm ſwelled, and became inflamed, which relieved the pain; and was taken for the gout, and continued ſeveral days. He after ſome months became dropſical both in reſpect to his cheſt and limbs, and was ſix or ſeven times perfectly relieved by one dram of ſaturated tincture of digitalis, taken two or three times a day for a few days in a glaſs of peppermint water. He afterwards breathed oxygen gas undiluted, in the quantity of ſix or eight gallons a day for three or four weeks without any effect, and ſunk at length from general debility.

In this inſtructive caſe I imagine the preſſure or ſtimulus of one part of the nerve within the

cheſt cauſed the other part, which ſerves the arm, to become torpid, and conſequently cold by ſympathy; and that the inflammation was the conſequence of the previous torpor and coldneſs of the arm, in the ſame manner as the ſwelling and inflammation of the cheek in tooth-ach, in the firſt ſpecies of this genus; and that many rheumatic inflammations are thus produced by ſympathy with ſome diſtant part.

14. *Diarrhœa a dentitione.* The diarrhœa, which frequently attends dentition, is the conſequence of indigeſtion; the aliment acquires chemical changes, and by its acidity acts as a cathartic; and changes the yellow bile into green, which is evacuated along with indigeſted parts of the coagulum of milk. The indigeſtion is owing to the torpor of the ſtomach and inteſtines cauſed by their aſſociation with the membranes of the gums, which are now ſtimulated into great exertion with pain; both which contribute to expend the general quantity of ſenſorial power, which belongs to this membranous aſſociation; and thus the ſtomach and inteſtines act with leſs than their natural energy. This is generally eſteemed a favourable ſymptom in difficult dentition, as the pain of the alveolar membranes exhauſts the ſenſorial power without producing convulſions for its relief. See Claſs I. 1. 4. 5. And the diarrhœa ceaſes, as the tooth advances.

ORDO

ORDO II.

Decreaſed Aſſociate Motions.

GENUS III.

Catenated with Voluntary Motions.

SPECIES.

1. *Titubatio linguæ.* Impediment of ſpeech is owing to the aſſociations of the motions of the organs of ſpeech being interrupted or diſſevered by ill-employed ſenſation or ſenſitive motions, as by awe, baſhfulneſs, ambition of ſhining, or fear of not ſucceeding, and the perſon uſes voluntary efforts in vain to regain the broken aſſociations, as explained in Sect. XVII. 1. 10. and XVII. 2. 10.

The broken aſſociation is generally between the firſt conſonant and the ſucceeding vowel; as in endeavouring to pronounce the word parable, the p is voluntarily repeated again and again, but the remainder of the word does not follow, becauſe the aſſociation between it and the next vowel is diſſevered.

M. M. The art of curing this defect is to cauſe the ſtammerer to repeat the word, which he finds difficult to ſpeak, eight or ten times without the initial letter, in a ſtrong voice, or with an aſpirate before it, as arable, or harable; and at length to ſpeak it very ſoftly with the initial letter p, para-

ble. This ſhould be practiſed for weeks or months upon every word, which the ſtammerer heſitates in pronouncing. To this ſhould be added much commerce with mankind, in order to acquire a careleſſneſs about the opinions of others.

2. *Chorea Sti. Viti.* In the St. Vitus's dance the patient can at any time lie ſtill in bed, which ſhews the motions not to be convulſive; and he can at different times voluntarily exert every muſcle of his body; which evinces, that they are not paralytic. In this diſeaſe the principal muſcle in any deſigned motion obeys the will; but thoſe muſcles, whoſe motions were aſſociated with the principal one, do not act; as their aſſociation is diſſevered, and thus the arm or leg is drawn outward, or inward, or backward, inſtead of upward or forward, with various geſticulations exactly reſembling the impediment of ſpeech.

This diſeaſe is frequently left after the itch has been too haſtily cured. See convulſio dolorifica, Claſs III. 1. 1. 6. A girl about eighteen, after wearing a mercurial girdle to cure the itch, acquired the Chorea St. Viti in ſo univerſal a manner, that her ſpeech became affected as well as her limbs; and there was evidently a diſunion of the common trains of ideas; as the itch was ſtill among the younger children of the family, ſhe was adviſed to take her ſiſter as a bedfellow, and thus

thus received the itch again; and the dance of St. Vitus gradually ceased. See Class II. 1. 5. 6.

M. M. Give the patient the itch again. Calomel a grain every night, or sublimate a quarter of a grain twice a day for a fortnight. Steel. Bark. Warm bath. Cold bath. Opium. Venesection once at the beginning of the disease. Electricity. Perpetual slow and repeated efforts to move each limb in the designed direction, as in the titubatio linguæ above described.

3. *Risus.* Laughter is a perpetual interruption of voluntary exertion by the interposition of pleasurable sensation; which not being checked by any important consequences rises into pain, and requires to be relieved or moderated by the frequent repetition of voluntary exertion. See Sect. XXXIV. 1. 4. and Class III. 1. 1. 4. and IV. 1. 3. 3.

4. *Tremor ex irâ.* The trembling of the limbs from anger. The interruption of the voluntary associations of motions by anger, originates from too great a part of the sensorial power being exerted on the organs of sense; whence the muscles, which ought to support the body upright, are deprived of their due quantity, and tremble from debility. See Class III. 2. 1. 1.

5. *Rubor ex irâ.* Redness from anger. Anger

is an excefs of averfion, that is of voluntarity not yet employed. It is excited by the pain of offended pride; when it is employed it becomes outrage, cruelty, infanity. The cutaneous capillaries, efpecially thofe of the face, are more mobile, that is, more eafily excited into increafed action, or more eafily become torpid, from lefs variation of fenforial power, than any other parts of the fyftem, which is owing to their being perpetually fubject to the viciffitudes of heat and cold, and of extenfion and corrugation. Hence, when an excefs of voluntarity exifts without being immediately expended in the actions of the large mufcles, the capillary arteries and glands acquire more energetic action, and a flufhed fkin is produced, with increafed feeretion of perfpirable matter, and confequent heat, owing to the paufe or interruption of voluntary action; and thus the actions of thefe cutaneous veffels become affociated between the irafcent ideas and irafcent mufcular actions, which are thus for a time interrupted.

6. *Rubor criminati.* The blufhing of accufed people, whether guilty or not, appears to be owing to circumftances fimilar to that of anger; for in thefe fituations there is always a fudden voluntarity, or wifh, of clearing their characters arifes in the mind of the accufed perfon; which, before an opportunity is given for it to be expended on the large mufcles, influences the capillary arteries

teries and glands, as in the preceding article. Whence the increaſed actions of the capillaries, and the conſequent redneſs and heat, become exerted between the voluntary ideas of ſelf-defence, and the muſcular actions neceſſary for that purpoſe; which laſt are thus for a time interrupted or delayed.

Even in the bluſh of modeſty or baſhfulneſs there is a ſelf-condemnation for ſome ſuppoſed defect or indecorum, and a ſudden voluntarity, or wiſh, of ſelf-defence; which not being expended in actions of the larger muſcles excites the capillaries into action; which in theſe ſubjects are more mobile than in others.

The bluſh of young girls on coming into an aſſembly room, where they expect their dreſs, and ſteps, and manner, to be examined, as in dancing a minuet, may have another origin; and may be conſidered as a hot fit of returning confidence, after a previous cold fit of fear.

7. *Tarditas paralytica.* By a ſtroke of the palſy or apoplexy it frequently happens, that thoſe ideas which were aſſociated in trains, whoſe firſt link was a voluntary idea, have their connection diſſevered; and the patient is under the neceſſity, by repeated efforts, ſlowly to renew their aſſociations. In this ſituation thoſe words, which have the feweſt other words aſſociated with them, as the proper names of perſons or

 places,

places, are the moſt difficult to recollect. And in thoſe efforts of recollection the word oppoſite to the word required is often produced, as hot for cold, winter for ſummer, which is owing to our aſſociating our ideas of things by their oppoſites as well as by their ſimilitudes, and in ſome inſtances perhaps more frequently, or more forcibly. Other paralytic patients are liable to give wrong names to external objects, as uſing the word pigs for ſheep, or cows for horſes; in this caſe the aſſociation between the idea of the animal and the name of it is diſſevered; but the idea of the claſs or genus of the thing remains; and he takes a name from the firſt ſpecies which preſents itſelf, and ſometimes can correct himſelf, till he finds the true one.

8. *Tarditas ſenilis.* Slowneſs of age. The difficulty of aſſociating ideas increaſes with our age; as may be obſerved from old people forgetting the buſineſs of the laſt hour, unleſs they impreſs it ſtrongly, or by frequent repetition, though they can well recollect the tranſactions of their youth. I ſaw an elderly man, who could reaſon with great clearneſs and preciſion, and in accurate language on ſubjects, which he had been accuſtomed to think upon; and yet did not know that he had rung the bell by his fire-ſide in one minute afterwards; nor could then recollect the object he had wanted, when his ſervant came.

Similar

Similar to this is the difficulty which old people experience in learning new bodily movements, that is, in associating new muscular actions, as in learning a new trade or manufacture. The trains of movements, which obey volition, are the last which we acquire; and the first, which are dissociated.

The symbols most in use, with which we have associated ideas, are those of visible and of audible language. It is curious to observe in the instruction of young people, that some remember written language the best, and others vocal language. The same thing sometimes occurs in aged people, that is, that some lose the ideas associated with sounds soonest, and others those associated with letters. See Recollectionis jactura, Class III. 2. 2. 1. and Tarditas paralytica above.

The following curious account of this defect of association of ideas with audible but not with visible symbols was sent me by Dr. Darwin of Shrewsbury.

"The case of an old man lately occurred to me, who was superannuated; his hearing and vision were perfect, but he could only call up a train of ideas from the latter. When he was told it was nine o'clock, and time for him to eat his breakfast, he repeated the words distinctly but without understanding them. His servant put a watch into his hand. "Why, William, have not I my breakfast, for it is just nine o'clock?"

he would ſay with expreſſion, that ſhewed he felt what he ſaid.

"On almoſt every occaſion his ſervants converſed with him by viſible objects, although his hearing was perfect; and when this kind of communication was uſed, he did not appear impaired in his intellects. This ſtate came on from a ſtroke of the palſy; and till he and his attendants uſed this kind of language he was quite childiſh."

ORDO II.

Decreased Associate Motions.

GENUS IV.

Catenated with External Influences.

As the diseases, which obey solar or lunar periods, commence with torpor or inactivity, such as the cold paroxysms of fevers, the torpor and consequent pain of hemicrania, and the pains which precede the fits of epilepsy and convulsion, it would seem, that these diseases are more generally owing to the diminution than to the excess of solar or lunar gravitation; as the diseases, which originate from the influence of the matter of heat, are much more generally in this country produced by the defect than by the excess of that fluid.

The periodic returns of so many diseases coincide with the diurnal, monthly, and annual rounds of time; that any one, who would deny the influence of the sun and moon on the periods of quotidian, tertian, and quartan fevers, must deny their effect on the tides, and on the seasons. It has generally been believed, that solar and lunar effect was exerted on the blood; which was thus rendered more or less stimulant to the system, as described in Sect. XXXII. 6. But as the fluid matter of gravitation permeates and covers all things, like the fluid matter of heat; I am induced

dueed to believe, that gravitation acts in its medium ſtate rather as a eauſa ſine quâ non of animal motion, like heat; whieh may diſorder the ſyſtem chemically or mechanieally, when it is diminiſhed; but may neverthelefs ſtimulate it, when inereaſed, into animal exertion.

Without heat and motion, which ſome philoſophers ſtill believe to be the ſame thing, as they ſo perpetually appear together, the particles of matter would attract and move towards each other, and the whole univerſe freeze or coaleſee into one ſolid maſs. Theſe therefore eounteract the gravitation of bodies to one eentre; and not only prevent the planets from falling into the ſun, but become either the effieient eauſes of vegetable and animal life, or the eauſes without whieh life cannot exiſt; as by their means the component partieles of matter are enabled to ſlide over each other with all the various degrees of fluidity and repulſion.

As the attraction of the moon eountervails or diminiſhes the terrene gravitation of bodies on the ſurface of the earth; a tide riſes on that ſide of the earth, which is turned towards the moon; and follows it, as the earth revolves. Another tide is raiſed at the ſame time on the oppoſite ſide of the revolving earth, which is owing to the greater eentrifugal motion of that ſide of the earth, which eounteracts the gravitation of bodies near its ſurfaee. For the earth and moon may be conſidered as two eannon balls of

different

different ſizes held together by a chain, and revolving once a month round a common centre of gravity between them, near the earth's ſurface; at the ſame time that they perform their annual orbits round the ſun. Whence the centrifugal force of that ſide of the earth, which is fartheſt from this centre of motion, round which the earth and moon monthly revolve, is conſiderably greater, than the centrifugal force of that ſide of the earth which is neareſt it: to which ſhould be added, that this centrifugal force not only contributes to diminiſh the terrene gravitation of bodies on the earth's ſurface on that ſide furtheſt from the centre of motion, but alſo to increaſe it on that ſide, which is neareſt it.

Another circumſtance, which tends to raiſe the tide on the part of the earth's ſurface, which is moſt diſtant from the moon, is, that the attraction of the moon is leſs on that part of the ocean, than it is on the other parts of the earth. Thus the moon may be ſuppoſed to attract the water on the ſide of the earth neareſt it with a power equal to three; and to attract the central parts of the earth with a power equal to two; and the water on the part of the earth moſt diſtant from the moon with a power only equal to one. Hence on the ſide of the earth moſt diſtant from the moon, the moon's attraction is leſs, and the centrifugal force round their common centre of motion is greater; both which contribute to raiſe the

tides

tides on that ſide of the earth. On the ſide of the earth neareſt the moon, the moon's attraction is ſo much greater as to raiſe the tides; though the centrifugal force of the ſurface of the earth round their common centre of motion in ſome degree oppoſes this effect.

On theſe accounts, when the moon is in the zenith or nadir, the gravitation of bodies on the earth's ſurface will be greateſt at the two oppoſite quadratures; that is, the greateſt gravitation of bodies on the earth's ſurface towards her centre during the lunar day is about ſix hours and a half after the ſouthing, or after the northing of the moon.

Circumſtances ſimilar to theſe, but in a leſs degree, muſt occur in reſpect to the ſolar influence on terreſtrial bodies; that is, there muſt be a diminution of the gravity of bodies near the earth's ſurface at noon, when the ſun is over them; and alſo at midnight from the greater centrifugal force of that ſide of the earth, which is moſt diſtant from the centre, round which the earth moves in her annual orbit, than on the ſide neareſt that centre. Whence it likewiſe follows, that the gravitation of bodies towards the earth is greateſt about ſix hours after noon, and after midnight.

Now when the ſun and moon have their united gravitation on the ſame ſide of the earth, as at the new moon; or when the ſolar attraction coincides with the greater centrifugal motion of that

ſide

ſide of the earth, which is furtheſt diſtant from the moon, as at the full moon; and when this happens about noon or midnight, the gravitation of terrene bodies towards the earth will be greater about ſix hours after noon, and after midnight, than at any other part of the lunar period; becauſe the attraction of both theſe luminaries is then exerted on thoſe ſides of the earth over which they hang, which at other times of the month are more or leſs exerted on other parts of it.

Laſtly, as heat and motion counteract the gravitation of the particles of bodies to each other, and hence become either the efficient cauſes of vegetable and animal life, or the cauſes without which life cannot exiſt, it ſeems to follow, that when our gravitation towards the earth's centre is greateſt, the powers of life ſhould be the leaſt; and hence that thoſe diſeaſes, which begin with torpor, ſhould occur about ſix hours after the ſolar or lunar noon, or about ſix hours after the ſolar or lunar midnight; and this moſt frequently about ſix hours after or before the new or full moon; and eſpecially when theſe happen at noon or at midnight; or laſtly, according to the combination of theſe powers in diminiſhing or increaſing the earth's attraction to bodies on its ſurface.

The returns or exacerbations of many fevers, both irritative and inflammatory, about ſix in the evening, and of the periodic cough deſcribed in

Sect. XXXVI. 3. 9. countenance this theory. Tables might be made out to ſhew the combined powers of the ſun and moon in diminiſhing the gravitation of bodies on the earth's ſurface, at every part of their diurnal, monthly, and annual periods; and which might facilitate the elucidation of this ſubject. But I am well aware of the difficulty of its application to diſeaſes, and hope theſe conjectures may induce others to publiſh more numerous obſervations, and more concluſive reaſonings.

SPECIES.

1. *Somni periodus.* The periods of ſleeping and of waking are ſhortened or prolonged by ſo many other circumſtances in animal life, beſides the minute difference between diurnal and nocturnal ſolar gravitation, that it can ſcarcely be aſcribed to this influence. At the ſame time it is curious to obſerve, that vegetables in reſpect to their times of ſleeping more regularly obſerve the hour of the day, than the preſence or abſence of light, or of heat, as may be ſeen by conſulting the calendar of Flora. Botanic Garden, Part II. Canto 2. l. 165. note.

Some diſeaſes, which at firſt ſight might be ſuppoſed to be influenced by ſolar periods, ſeem to be induced by the increaſing ſenſibility of the ſyſtem to pain during our ſleeping hours; as ex-

plained in Sect. XVIII. 15. Of these are the fits of asthma, of some epilepsies, and of some hæmoptoes; all which disturb the patient after some hours sleep, and are therefore to be ascribed to the increase of our dormant sensibility. There may likewise be some doubt, whether the commencement of the pain of gout in the foot, as it generally makes its attack after sleep, should be ascribed to the increased sensibility in sleep, or to solar influence?

M. M. When asthmatic or epileptic fits or hæmoptoe occur after a certain number of hours of sleep, the patient should be forcibly awakened before the expected time by an alarm clock, and drink a cup of chocolate or lemonade.—Or a grain of opium should be given at going to bed.—In one case to prevent the too great increase of sensibility by shortening the time of sleep; and in the other by increasing the irritative motions, and expending by that means a part of the sensorial power.

2. *Studii inanis periodus.* Class III. 1. 2. 2. The cataleptic spasm which preceded the reverie and somnambulation in the patient, whose case is related in Sect. XIX. 2. occurred at exactly the same hour, which was about eleven in the morning for many weeks; till those periods were disturbed by large doses of opium; and must therefore be referred to some effect of solar gravitation.

tation. In the caſe of Maſter A. Sect. XXXIV. 3. as the reverie began early in the morning during ſleep, there may be a doubt, whether this commenced with torpor of ſome organ catenated with ſolar gravitation; or was cauſed by the exiſtence of a previous torpid part, which only became ſo painful as to excite the exertions of reverie by the perpetual increaſe of ſenſibility during the continuance of ſleep, as in ſome fits of epilepſy, aſthma, and hæmoptoe mentioned in the preceding article.

3. *Hemicraniæ periodus.* Periods of hemicrania. Claſs IV. 2. 2. 8. The torpor and conſequent pain of ſome membranes on one ſide of the head, as over one eye, are frequently occaſioned by a decaying tooth, and are liable to return every day, or on alternate days at ſolar or lunar periods. In this caſe large quantities of the bark will frequently cure the diſeaſe, and eſpecially if preceded by veneſection and a briſk cathartic; but if the offending tooth can be detected, the moſt certain cure is its extraction. Theſe partial head-achs are alſo liable to return at the greater lunar periods, as about once a month. Five drops from a two-ounce phial of a ſaturated ſolution of arſenic twice a day for a week or two have been ſaid to prevent the returns of this diſeaſe. See a Treatiſe on Arſenic by Dr. Fowler, of York. Strong errhines have alſo been recommended.

4. *Epilepſia*

4. *Epilepſiæ dolorificæ periodus.* Claſs III. 1. 1. 8. The pain which induces after about an hour the violent convulſions or inſanity, which conſtitute the painful epilepſy, generally obſerve ſolar diurnal periods for four or five weeks, and are probably governed by ſolar and lunar times in reſpect to their greater periods; for I have obſerved that the daily paroxyſms, unleſs diſturbed by large doſes of opium, recur at very nearly the ſame hour, and after a few weeks the patients have recovered to relapſe again at the interval of a few months. But more obſervations are wanted upon this ſubject, which might be of great advantage in preventing the attacks of this diſeaſe; as much leſs opium given an hour before its expected daily return will prevent the paroxyſm, than is neceſſary to cure it, after it has commenced.

5. *Convulſionis dolorificæ periodus.* Claſs III. 1. 1. 6. The pains, which produce theſe convulſions, are generally left after rheumatiſm, and come on when the patients are become warm in bed, or have been for a ſhort time aſleep, and are therefore perhaps rather to be aſcribed to the increaſing ſenſibility of the ſyſtem during ſleep, than to ſolar diurnal periods, as in Species firſt and ſecond of this Genus.

6. *Tuſſis periodicæ periodus.* Periodic cough, Claſs IV. 2. 1. 9. returns at exact ſolar periods;

that deſcribed in Sect. XXXVI. 3. 9. recurred about ſeven in the afternoon for ſeveral weeks, till its periods were diſturbed by opium, and then it recurred at eleven at night for about a week, and was then totally deſtroyed by opium given in very large quantities, after having been previouſly for a few days omitted.

7. *Catameniæ periodus.* Periods of menſtruation. The correſpondence of the periods of the catamenia with thoſe of the moon was treated of in Sect. XXXII. 6. and can admit of no more doubt, than that the returns of the tides are governed by lunar influence. But the manner in which this is produced, is leſs evident; it has commonly been aſcribed to ſome effect of the lunar gravitation on the circulating blood, as mentioned in Sect. XXXII. 6. But it is more analogous to other animal phenomena to ſuppoſe that the lunar gravitation immediately affects the ſolids by its influx or ſtimulus. Which we believe of the fluid element of heat, in which we are equally immerſed; and of the electric fluid, which alſo ſurrounds and pervades us. See Sect. XXXVI. 2. 3.

If the torpor of the uterine veins, which induces the monthly periods of the catamenia, be governed by the increaſe of terrene gravitation; that is, by the deficiency of the counter-influence of ſolar and lunar gravitation; why does not it

occur

occur moſt frequently when the terrene gravitation is the greateſt, as about ſix hours after the new moon, and next to that at about ſix hours after the full moon? This queſtion has its difficulty; firſt, if the terrene gravitation be greateſt about ſix hours after the new moon, it muſt become leſs and leſs about the ſame time every lunar day, till the end of the firſt quarter, when it will be the leaſt; it muſt then increaſe daily till the full. After the full the terrene gravitation muſt again decreaſe till the end of the third quarter, when it will again be the leaſt, and muſt increaſe again till the new moon; that is, the ſolar and lunar counter-gravitation is greateſt, when thoſe luminaries are vertical, at the new moon, and full moon, and leaſt about ſix hours afterwards. If it was known, whether more menſtruations occur about ſix hours after the moon is in the zenith or nadir; and in the ſecond and fourth quarters of the moon, than in the firſt and third; ſome light would be thrown on this ſubject; which muſt in that reſpect wait for future obſervations.

Secondly, if the lunar influence produces a very ſmall degree of quieſcence, ſuppoſe of the uterine veins, at firſt; and if that recurs at certain periods, as of lunar days, or about 25 hours, even with leſs power to produce quieſcence than at firſt; yet the quieſcence will daily increaſe by the acquired habit acting at the ſame time, as

explained in Sect. XII. 3. 3. till at length so great a degree of quiescence will be induced as to cause the inaction of the veins of the uterus, and consequent venous hæmorrhage. See Sect. XXXII. 6. Class I. 2. 1. 11. IV. 1. 4. 4. See the introduction to this Genus.

8. *Hæmorrhoidis periodus.* The periods of the piles depend on the torpor of the veins of the rectum, and are believed to recur nearly at monthly intervals. See Sect. XXVII. 2. and Class I. 2. 1. 6.

9. *Podagræ periodus.* The periods of gout in some patients recur at annual intervals, as in the case related above in Class IV. 1. 2. 15. in which the gouty paroxysm returned for three successive years on nearly the same day of the month. The commencement of the pain of each paroxysm is generally a few hours after midnight, and may thence either be induced by diurnal solar periods, or by the increasing sensibility during sleep, as mentioned in the first species of this genus.

10. *Erysipelatis periodus.* Some kinds of erysipelas which probably originate from the association of the cutaneous vessels with a diseased liver, occur at monthly periods, like the hæmorrhois or piles; and others at annual periods, like the gout; as a torpor of some part I suppose always precedes

cedes the eryſipelatous inflammation, the periods ſhould accord with the increaſing influence of terrene gravitation, as deſcribed in the introduction to this Genus, and in Species the ſeventh of it. Other periods of diſeaſes referable to ſolar and lunar influence are mentioned in Section XXXVI. and many others will probably be diſcovered by future obſervation.

11. *Febrium periodus.* Periods of fevers. The commencement of the cold fits of intermittent fevers, and the daily exacerbations of other fevers, ſo regularly recur at diurnal ſolar or lunar periods, that it is impoſſible to deny their connection with gravitation; as explained in Sect. XXXVI. 3. Not only theſe exacerbations of fever, and their remiſſions, and the diurnal ſolar and lunar periods; but the preparatory circumſtances, which introduce fevers, or which determine their criſiſes, appear to be governed by the parts of monthly lunar periods, and of ſolar annual ones. Thus the variolous fever in the natural ſmall-pox commences on the 14th day, and in the innoculated ſmall-pox on the ſeventh day. The fever and eruption in the diſtinct kind take up another quarter of a lunation, and the maturation another quarter.

The fever, which is termed canine madneſs, or hydrophobia, is believed to commence near the new or full moon; and, if the cauſe is not then great enough to bring on the diſeaſe, it ſeems to

acquire ſome ſtrength, or to lie dormant, till another, or perhaps more powerful lunation calls it into action. In the ſpring, about three or four years ago, a mad dog very much worried one ſwine confined in a ſty, and bit another in the ſame ſty in a leſs degree; the former became mad, refuſed his meat, was much convulſed, and died in about four days; this diſeaſe commenced about a month after the bite. The other ſwine began to be ill about a month after the firſt, and died in the ſame manner.

ORDO III.

Retrograde Associate Motions.

GENUS I.

Catenated with Irritative Motions.

THOSE retrograde associate motions, the first links of which are catenated with irritative motions, belong to this genus. All the retrograde motions are consequent to debility, or inactivity, of the organ; and therefore properly belong to the genera of decreased actions both in this and the former classes.

SPECIES.

1. *Diabetes irritata.* When the absorbents of the intestines are stimulated too strongly by spirit of wine, as in the beginning of drunkenness, the urinary absorbents invert their motions. The same happens from worms in the intestines. In other kinds of diabetes may not the remote cause be the too strong action of the cutaneous absorbents, or of the pulmonary ones? May not in such cases oil externally or internally be of service? or warm bathing for an hour at a time? In hysteric inversions of motion is some other part too much stimulated? or pained from the want of stimulus?

2. *Sudor frigidus in aſthmate.* The cauſe of the paroxyſms of humoral aſthma is not well underſtood; I ſuppoſe it to be owing to a torpidity or inaction of the abſorbents belonging to the pulmonary veſſels, as happens probably to other viſcera at the commencement of intermittent fevers, and to a conſequent accumulation of fluids in them; which at length producing great irritation or uneaſy ſenſation cauſes the violent efforts to produce the abſorption of it. The motions of the cutaneous abſorbent veſſels by their aſſociation with thoſe of the pulmonary ones become retrograde, and effuſe upon the ſkin a fluid, which is ſaid to be viſcid, and which adheres in drops.

A few days ago I ſaw a young man of delicate conſtitution in what was called a fit of the aſthma; he had about two months before had a peripneumony, and had been ever ſince ſubject to difficult reſpiration on exertion, with occaſional palpitation of his heart. He was now ſeized about eight at night after ſome exertion of mind in his buſineſs with cold extremities, and difficulty of breathing. He gradually became worſe, and in about half an hour, the palpitation of his heart and difficult reſpiration were very alarming; his whole ſkin was cold and pale, yet he did not ſhudder as in cold paroxyſm of fever; his tongue from the point to the middle became as cold as his other extremities, with cold breath. He ſeemed to be in the act of dying, except that his

pulſe continued equal in time, though very quick. He loſt three ounces of blood, and took ten drops of laudanum with muſk and ſalt of hartſhorn, and recovered in an hour or two without any cold ſweat.

There being no cold ſweat ſeems to indicate, that there was no accumulation of ſerous fluid in the lungs; and that their inactivity, and the coldneſs of the breath, was owing to the ſympathy of the air-cells with ſome diſtant part. There was no ſhuddering produced, becauſe the lungs are not ſenſible to heat and cold; as any one may obſerve by going from a warm room into a froſty air, and the contrary. So the ſteam of hot tea, which ſcalds the mouth, does not affect the lungs with the ſenſation of heat. I was induced to believe that the whole cold fit might be owing to ſuppuration in ſome part of the cheſt; as the general difficulty of breathing ſeemed to be increaſed after a few days with pulſe of 120, and other ſigns of empyema. Do the cold ſweat, and the occurrence of the fits of aſthma after ſleep, diſtinguiſh the humoral aſthma from the cold paroxyſm of intermittents, or that which attends ſuppuration, or which precedes inflammation?—I heard a few weeks afterwards, that he ſpit up much matter at the time he died.

3. *Diabetes a timore.* The motions of the abſorbent veſſels of the neck of the bladder become inverted by their conſent with thoſe of the ſkin; which

which are become torpid by their reverſe ſympathy with the painful ideas of fear, as in Sect. XVI. 8. 1. whence there is a great diſcharge of pale urine, as in hyſteric diſeaſes.

The ſame happens from anxiety, where the painful ſuſpenſe is continued, even when the degree of fear is ſmall; as in young men about to be examined for a degree at the univerſities the frequency of making water is very obſervable. When this anxiety is attended with a ſleepleſs night, the quantity of pale urine is amazingly great in ſome people, and the micturition very frequent.

M. M. Opium. Joy. Conſolations of friendſhip.

4. *Diarrhœa a timore.* The abſorbent veſſels of the inteſtines invert their motions by direct conſent with the ſkin; hence many liquid ſtools as well as much pale urine are liable to accompany continued fear, along with coldneſs of the ſkin. The immediate cauſe of this is the decreaſed ſenſorial power of aſſociation, which intervenes between the actions of the abſorbents of the cold ſkin, and thoſe of the inteſtinal abſorbents; the motions of the latter become on that account weakened and at length retrograde. The remote cauſe is the torpor of the veſſels of the ſkin catenated with the pain of fear, as explained in Sect. XVI. 8. 1.

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The capillaries of the ſkin conſent more generally by direct ſympathy with thoſe of the lower inteſtines, and of the bladder; but by reverſe ſympathy more generally with thoſe of the ſtomach and upper inteſtines. As appears in fevers, where the hot ſkin accompanies indigeſtion of the ſtomach; and in diarrhœas attended with cold extremities.

The remote cauſe is the torpor of the ſkin owing to its reverſe ſympathy with the painful ſenſual motions, or ideas, of fear; which are now actuated with great energy, ſo as to deprive the ſecond link of aſſociated motions of their due ſhare of ſenſorial power. It is alſo probable, that the pain of fear itſelf may contribute to exhauſt the ſenſorial power, even when it produces no muſcular action. See Claſs IV. 2. 2.

5. *Pallor et tremor a timore.* A retrograde action of the capillaries of the ſkin producing paleneſs, and a torpor of the muſcular fibres of the limbs occaſioning trembling, are cauſed by their reverſe aſſociations with the ideas or imaginations of fear; which are now actuated with violent energy, and accompanied with great pain. The cauſe of theſe aſſociations are explained in Sect. XVI. 8. 1.

Theſe torpid actions of the capillaries and muſcles of the limbs are not cauſed immediately by the painful ſenſation of fear; as in that caſe they

they would have been increaſed and not decreaſed actions, as occurs in anger; where the painful volition increaſes the actions of the capillaries, exciting a bluſh and heat of the ſkin. Whence we may gain ſome knowledge of what is meant by depreſſing and exciting paſſions; the former conſiſting of ideas attended with pain, which pain occaſions no muſcular actions, like the pain of cold head-ach; the latter being attended with volitions, and conſequent muſcular exertions.

That is, the pain of fear, and the pain of anger, are produced by the exertion of certain ideas, or motions of certain nerves of ſenſe; in the former caſe, the painful ſenſation of fear produces no muſcular actions, yet it exhauſts or employs ſo much ſenſorial power, that the whole ſyſtem acts more feebly, or becomes retrograde; but ſome parts of it more ſo than others, according to their early aſſociations deſcribed in Sect. XVI. 8. 1. hence the tremor of the limbs, palpitation of heart, and even ſyncope. In anger the painful volition produces violent muſcular actions; but if previous to theſe any deliberation occurs, a fluſhed countenance ſometimes, and a red ſkin, are produced by this ſuperabundance of volition exerted on the arterial ſyſtem; but at other times the ſkin becomes pale, and the legs tremble, from the exhauſtion or expenditure of the ſenſorial power by the painful volitions of anger on

the

the organs of ſenſe, as by the painful ſenſations of fear above mentioned.

Where the paſſion of fear exiſts in a great degree, it exhauſts or expends ſo much ſenſorial power, either ſimply by the pain which attends it, or by the violent and perpetual excitement of the terrific imaginations or ideas, that not only a cold and pale ſkin, but a retrograde motion of the cutaneous abſorbents occurs, and a cold ſweat appears upon the whole ſurface of the body; which probably ſometimes increaſes pulmonary abſorption; as in Claſs II. 1. 6. 4. and as in the cold ſweats, which attend the paroxyſms of humoral aſthma. Hence anxiety, which is a continued pain of fear, ſo univerſally debilitates the conſtitution as to occaſion a lingering death; which happens much more frequently than is uſually ſuppoſed; and theſe victims of continued anxiety are ſaid to die of a broken heart. Other kinds of paleneſs are deſcribed in Claſs I. 2. 2. 2.

M. M. Opium. Wine. Food. Joy.

6. *Palpitatio cordis a timore.* The palpitation of the heart from fear is owing to the weak action of it, and perhaps ſometimes to the retrograde exertion of the ventricles and auricles; becauſe it ſeems to be affected by its aſſociation with the capillaries, the actions of which, with thoſe of the arteries and veins, conſtitute one great circle of aſſociate motions. Now when the capillaries

of

of the ſkin become torpid, coldneſs and paleneſs ſucceed; and with theſe are aſſociated the capillaries of the lungs, whence difficult reſpiration; and with theſe the weak and retrograde actions of the heart. At the ſame time the abſorbents of the ſkin, and of the bladder, and of the inteſtines, ſometimes become retrograde, and regurtitate their contents; as appears by the pale urine in large quantities, which attends hyſteric complaints along with this palpitation of the heart; and from the cold ſweats, and diarrhœa; all which, as well as the hyſteric complaints, are liable to be induced or attended by fear.

When fear has ſtill more violently affected the ſyſtem, there have been inſtances where ſyncope, and ſudden death, or a total ſtoppage of the circulation, have ſucceeded: in theſe laſt caſes, the pain of fear has employed or exhauſted the whole of the ſenſorial power, ſo that not only thoſe muſcular fibres generally exerted by volition ceaſe to act, whence the patient falls down; and thoſe, which conſtitute the organs of ſenſe, whence ſyncope; but laſtly thoſe, which perform the vital motions, become deprived of ſenſorial power, and death enſues. See Claſs I. 2. 1. 4. and I. 2. 1. 10. Similar to this in ſome epileptic fits the patient firſt ſuddenly falls down, without even endeavouring to ſave himſelf by his hands before the convulſive motions come on. In this caſe the great exertion of ſome ſmall part in conſe-

quence of great irritation or ſenſation exhauſts the whole ſenſorial power, which was lodged in the extremities of the locomotive nerves, for a ſhort time, as in ſyncope; and as ſoon as theſe muſcles are again ſupplied, convulſions ſupervene to relieve the painful ſenſation. See Claſs III. 1. 1. 7.

7. *Abortio a timore.* Women miſcarry much more frequently from a fright, than from bodily injury. A torpor or retrograde motion of the capillary arteries of the internal uterus is probably the immediate cauſe of theſe miſcarriages, owing to the aſſociation of the actions of thoſe veſſels with the capillaries of the ſkin, which are rendered torpid or retrograde by fear. By this contraction of the uterine arteries, the fine veſſels of the placenta, which are inſerted into them, are detruded, or otherwiſe ſo affected, that the placenta ſeparates at this time from the uterus, and the fetus dies from want of oxygenation. A ſtrong young woman, in the fifth or ſixth month of her pregnancy, who has ſince borne many children, went into her cellar to draw beer; one of her ſervant boys was hid behind a barrel, and ſtarted out to ſurpriſe her, believing her to be the maid-ſervant; ſhe began to flood immediately, and miſcarried in a few hours. See Sect. XXXIX. 6. 5. and Claſs I. 2. 1. 14.

8. *Hyſteria a timore.* Some delicate ladies are liable

liable to fall into hyſteric fits from ſudden fright. The periſtaltic motions of the bowels and ſtomach, and thoſe of the œſophagus, make a part of the great circle of irritative motions with thoſe of the ſkin, and many other membranes. Hence when the cutaneous veſſels become torpid from their reverſe ſympathy with the painful ideas of fear; theſe of the bowels, and ſtomach, and œſophagus, become firſt torpid by direct ſympathy with thoſe of the ſkin, and then feebly and ineffectually invert the order of their motions, which conſtitutes a paroxyſm of the hyſteric diſeaſe. See Claſs I. 3. 1. 10. Theſe hyſteric paroxyſms are ſometimes followed by convulſions, which belong to Claſs III. as they are exertions to relieve pain; and ſometimes by death. See Species 9. of this Genus, and Claſs I. 2. 1. 4.

Indigeſtion from fear is to be aſcribed in the ſame manner to the torpor of the ſtomach, owing to its aſſociation with the ſkin. As in Claſs IV. 1. 2. 5. IV. 2. 1.

ORDO

ORDO III.

Retrograde Associate Motions.

GENUS II.

Catenated with Sensitive Motions.

SPECIES.

1. *Nausea idealis.* Nausea from disgustful ideas, as from nauseous stories, or disgustful sights, or smells, or tastes, as well as vomiting from the same causes, consists in the retrograde actions of the lymphatics of the throat, and of the œsophagus, and stomach; which are associated with the disgustful ideas, or sensual motions of sight, or hearing, or smell, or taste; for as these are decreased motions of the lymphatics, or of the œsophagus, or stomach, they cannot immediately be excited by the sensorial power of painful sensation, as in that case they ought to be increased motions. So much sensorial power is employed for a time on the disgustful idea, or expended in the production of inactive pain, which attends it, that the other parts of the associated chain of action, of which this disgustful idea is now become a link, are deprived of their accustomed share; and therefore first stop, and then invert their motions. Owing to defi-

ciency of ſenſorial power, as explained more at large in Sect. XXXV. 1. 3.

2. *Nauſea a conceptu.* The nauſea, which pregnant women are ſo ſubject to during the firſt part of geſtation, is owing to the reverſe ſympathy between the uterus and ſtomach, ſo that the increaſed action of the former, excited by the ſtimulus of the growing embryon, which I believe is ſometimes attended with ſenſation, produces decreaſed actions of the latter with the diſagreeable ſenſation of ſickneſs with indigeſtion and conſequent acidity. When the fetus acquires ſo much muſcular power as to move its limbs, or to turn itſelf, which is called quickening, this ſickneſs of pregnancy generally ceaſes.

M. M. Calcined magneſia. Rhubarb. Half a grain of opium twice a day. Recumbent poſture on a ſofa.

3. *Vomitio vertiginoſa.* Sea-ſickneſs, the irritative motions of viſion, by which we balance ourſelves, and preſerve our perpendicularity, are diſturbed by the indiſtinctneſs of their objects; which is either owing to the ſimilarity of them, or to their diſtance, or to their apparent or unuſual motions. Hence theſe irritative motions of viſion are exerted with greater energy, and are in conſequence attended with ſenſation; which at firſt is agreeable, as when children ſwing on a

 rope;

rope; afterwards the irritative motions of the ſtomach, and of the abſorbent veſſels, which open their mouths into it, become inverted by their aſſociations with them by reverſe ſympathy.

For the action of vomiting, as well as the diſagreeable ſenſation of ſickneſs, are ſhewn to be occaſioned by defect of the ſenſorial power; which in this caſe is owing to the greater expenditure of it by the ſenſe of viſion. On the ſame account the vomiting, which attends the paſſage of a ſtone through the ureter, or an inflammation of the bowels, or the commencement of ſome fevers, is cauſed by the increaſed expenditure of the ſenſorial power by the too great action of ſome links of the aſſociations of irritative motions; and there being in conſequence a deficiency of the quantity required for other links of this great catenation.

It muſt be obſerved, that the expenditure of ſenſorial power by the retinas of the eyes is very great; which may be eſtimated by the perpetual uſe of thoſe organs during our waking hours, and during moſt of our ſleeping ones; and by the large diameters of the two optic nerves, which are nearly the ſize of a quill, or equal to ſome of the principal nerves, which ſerve the limbs.

4. *Vomitio a calculo in uretere.* The action of vomiting in conſequence of the increaſed or decreaſed actions of the ureter, when a ſtone lodges

in it. The natural actions of the ſtomach, which conſiſt of motions ſubject to intermitted irritations from the fluids, which paſs through it, are aſſociated with thoſe of the ureter; and become torpid, and conſequently retrograde, by intervals, when the actions of the ureter become torpid owing to previous great ſtimulus from the ſtone it contains; as appears from the vomiting exiſting when the pain is leaſt. When the motions of the ureter are thus leſſened, the ſenſorial power of aſſociation, which ought to actuate the ſtomach along with the ſenſorial power of irritation, ceaſes to be excited into action; and in conſequence the actions of the ſtomach become leſs energetic, and in conſequence retrograde.

For as vomiting is a decreaſed action of the ſtomach, as explained in Sect. XXXV. 1. 3. it cannot be ſuppoſed to be produced by the pain of gravel in the ureter alone, as it ſhould then be an increaſed action, not a decreaſed one.

The perpetual vomiting in ileus is cauſed in like manner by the defective excitement of the ſenſorial power of aſſociation by the bowel, which is torpid during the intervals of pain; and the ſtomach ſympathizes with it. See Enteritis, Claſs II. 1. 2. 11. Does this ſymptom of vomiting indicate, whether the diſeaſe be above or below the valve of the colon? Does not the ſofter pulſe in ſome kinds of enteritis depend on the

ſympathy of the heart and arteries with the ſickneſs of the ſtomach? See Ileus and Cholera.

Hence this ſickneſs, as well as the ſickneſs in ſome fevers, cannot be eſteemed an effort of nature to diſlodge any offenſive material; but like the ſea-ſickneſs deſcribed above, and in Sect. XX. 4. is the conſequence of the aſſociations of irritative or ſenſitive motions. See Claſs I. 1. 3. 9.

5. *Vomitio ab inſultu paralytico.* Paralytic affections generally commence with vomiting, the ſame frequently happens from a violent blow with a ſtick on the head; this curious connection of the brain and ſtomach has not been explained; as it reſembles the ſickneſs in conſequence of vertigo at ſea, it would ſeem to ariſe from a ſimilar cauſe, viz. from diſturbed irritative or ſenſitive aſſociations.

6. *Vomitio a titillatione faucium.* If the throat be ſlightly tickled with a feather, a nauſea is produced, that is, an inverted action of the mouths of the lymphatics of the fauces, and by direct ſympathy an inverted action of the ſtomach enſues. As theſe parts have frequently been ſtimulated at the ſame time into pleaſurable action by the deglutition of our daily aliment, their actions become ſtrongly aſſociated. And as all the food we ſwallow, is either moiſt originally, or mixed with our moiſt ſaliva in the mouth; a

feather, which is originally dry, and which in ſome meaſure repels the moiſt ſaliva, is diſagreeable to the touch of the fauces; at the ſame time this nauſea and vomiting cannot be cauſed by diſagreeable ſenſation ſimply, as then they ought to have been increaſed exertions, and not decreaſed ones, as ſhewn in Section XXXV. 1. 3. But the mouths of the lymphatics of the fauces are ſtimulated by the dry feather into too great action for a time, and become retrograde afterwards by the debility conſequent to too great previous ſtimulus.

7. *Vomitio cute ſympathetica.* Vomiting is ſucceſsfully ſtopped by the application of a bliſter on the back in ſome fevers, where the extremities are cold, and the ſkin pale. It was ſtopped by Sydenham by producing a ſweat on the ſkin by covering the head with the bedclothes. See Claſs IV. 1. 1. 3. and Suppl. I. 11. 6.

ORDO

ORDO III.

Retrograde Associate Motions.

GENUS III.

Catenated with Voluntary Motions.

SPECIES.

1. *Ruminatio.* In the rumination of horned cattle the food is brought up from the first stomach by the retrograde motions of the stomach and œsophagus, which are catenated with the voluntary motions of the abdominal muscles.

2. *Vomitio voluntaria.* Voluntary vomiting. Some human subjects have been said to have obtained this power of voluntary action over the retrograde motions of the stomach and œsophagus, and thus to have been able to empty their stomach at pleasure. See Sect. XXV. 6. This voluntary act of emptying the stomach is possessed by some birds, as the pigeon; who has an organ for secreting milk in its stomach, as Mr. Hunter observed; and softens the food for its young by previously swallowing it; and afterwards putting its bill into theirs returns it into their mouths. See Sect. XXXIX. 4. 8. The pelicans use a stomach, or throat bag, for the purpose of bringing the fish, which they catch in the sea to shore,

and then eject them, and eat them at their leisure. See Sect. XVI. 11. And I am well informed of a bitch, who having puppies in a stable at a diſtance from the houſe, ſwallowed the fleſh-meat, which was given her, in large pieces, and carrying it immediately to her whelps, brought it up out of her ſtomach, and laid it down before them.

3. *Eructatio voluntaria.* Voluntary eructation. Some, who have weak digeſtions, and thence have frequently been induced to eruct the quantity of air diſcharged from the fermenting aliment in their ſtomachs, have gradually obtained a power of voluntary eructation, and have been able thus to bring up hogſheads of air from their ſtomachs, whenever they pleaſed. This great quantity of air is to be aſcribed to the increaſe of the fermentation of the aliment by drawing off the gas as ſoon as it is produced. See Sect. XXIII. 4.

ORDO

ORDO III.

Retrograde Associate Motions.

GENUS IV.

Catenated with External Influences.

SPECIES.

1. *Catarrhus periodicus.* Periodical catarrh is not a very uncommon diſeaſe; there is a great diſcharge of a thin ſaline mucous material from the membranes of the noſtrils, and probably from the maxillary and frontal ſinuſes, which recur once a day at exact ſolar periods; unleſs it be diſturbed by exhibition of opium; and reſembles the periodic cough mentioned below. See Claſs I, 3. 2. 1. It is probably owing to the retrograde action of the lymphatics of the membranes affected, and produced immediately by ſolar influence.

2. *Tuſſis periodica.* Periodic cough, called nervous cough, and tuſſis ferina. It ſeems to ariſe from a periodic retrograde action of the lymphatics of the membrane, which lines the air-cells of the lungs. And the action of coughing, which is violent for an hour or longer, is probably excited by the ſtimulus of the thin fluid thus produced,

produced, as well as by the diſagreeable ſenſation attending membranous inactivity; and reſembles periodic catarrh not only in its ſituation on a mucous membrane, but in the diſcharge of a thin fluid. As it is partly reſtrainable, it does not come under the name of convulſion; and as it is not attended with difficult reſpiration, it cannot be called aſthma; it is cured by very large doſes of opium, ſee a caſe and cure in Sect. XXXVI. 3. 9. ſee Claſs IV. 2. 4. 6. and ſeems immediately to be induced by ſolar influence.

3. *Hyſteria a frigore.* Hyſteric paroxyſms are occaſioned by whatever ſuddenly debilitates the ſyſtem, as fear, or cold, and perhaps ſometimes by external moiſture of the air, as all delicate people have their days of greater or leſs debility, ſee Claſs IV. 3. 1. 8.

4. *Nauſea pluvialis.* Sickneſs at the commencement of a rainy ſeaſon is very common among dogs, who aſſiſt themſelves by eating the agroſtis canina, or dog's graſs, and thus empty their ſtomachs. The ſame occurs with leſs frequency to cats, who make uſe of the ſame expedient. See Sect. XVI. 11. I have known one perſon, who from his early years has always been ſick at the beginning of wet weather, and ſtill continues ſo. Is this owing to a ſympathy of the mucous membrane of the ſtomach with the mechanical relax-

ation

ation of the external cuticle by a moiſter atmoſphere, as is ſeen in the corrugated cuticle of the hands of waſher-women? or does it ſympathize with the mucous membrane of the lungs, which muſt be affected along with the mucus on its ſurface by the reſpiration of a moiſter atmoſphere?

SUPPLEMENT.

SUPPLEMENT

TO

CLASS IV.

Sympathetic Theory of Fever.

As fever consists in the increase or diminution of direct or reverse associated motions, whatever may have been the remote cause of them, it properly belongs to the fourth class of diseases; and is introduced at the end of the class, that its great difficulties might receive elucidation from the preceding parts of it. These I shall endeavour to enumerate under the following heads, trusting that the candid reader will discover in these rudiments of the theory of fever a nascent embryon, an infant Hercules, which Time may rear to maturity, and render serviceable to mankind.

I. Simple fever of two kinds.
II. Compound fever.
III. Termination of the cold fit.
IV. Return of the cold fit.
V. Sensation excited in fever.
VI. Circles of associated motions.

VII. Alter-

I. *Simple Fever.*

1. When a small part of the cutaneous capillaries with their mucous or perspirative glands are for a short time exposed to a colder medium, as when the hands are immersed in iced water for a minute, these capillary vessels and their glands become torpid or quiescent, owing to the eduction of the stimulus of heat. The skin then becomes pale, because no blood passes through the external capillaries; and appears shrunk, because their sides are collapsed from inactivity, not contracted by spasm; the roots of the hair are left prominent from the receding or subsiding of the skin around them; and the pain of coldness is produced.

In this situation, if the usual degree of warmth be applied, these vessels regain their activity; and having now become more irritable from an accumulation

mulation of the ſenſorial power of irritation during their quieſcence, a greater exertion of them follows, with an increaſed glow of the ſkin, and another kind of pain, which is called the hot-ach; but no fever, properly ſo called, is yet produced; as this effect is not univerſal, nor permanent, nor reeurrent.

2. If a greater part of the cutaneous capillaries with their mucous and perſpirative glands be expoſed for a longer time to cold, the torpor or quieſcence becomes extended by direct ſympathy to the heart and arteries; which is known by the weakneſs, and conſequent frequency of the pulſe in cold fits of fever.

This requires to be further explained. The movements of the heart and arteries, and the whole of the circulatory veſſels, are in general excited into action by the two ſenſorial powers of irritation, and of aſſociation. The former is excited by ſtimulus, the latter by the previous actions of a part of the vital circle of motions. In the above ſituation the capillaries act weakly from defect of irritation, which is cauſed by deficient ſtimulus of heat; but the heart and arteries act weakly from defect of aſſociation, which is owing to the weak action of the capillaries; which does not now excite the ſenſorial power of aſſociation into action with ſufficient energy.

After a time, either by the application of warmth,

warmth, or by the increaſe of their irritability owing to the accumulation of the ſenſorial power of irritation during their previous quieſcence, the capillary veſſels and glands act with greater energy than natural; whence the red colour and heat of the ſkin. The heart and arteries acquire a greater ſtrength of pulſation, and continue the frequency of it, owing to the accumulation of the ſenſorial power of aſſociation during their previous torpor, and their conſequent greater aſſociability; which is now alſo more ſtrongly excited by the increaſed actions of the capillaries. And thus a fit of ſimple fever is produced, which is termed Febris irritativa; and conſiſts of a torpor of the cutaneous capillaries with their mucous and perſpirable glands, accompanied with a torpor of the heart and arteries; and afterwards of an increaſed action of all theſe veſſels, by what is termed direct ſympathy.

This fever, with ſtrong pulſe without inflammation, or febris irritativa, deſcribed in Claſs I. 1. 1. 1. is frequently ſeen in vernal intermittents, as the orgaſm of the heart and arteries is then occaſioned by their previous ſtate of torpor; but more rarely I believe exiſts in the type of continued fever, except there be an evident remiſſion, or approximation to a cold fit; at which time a new accumulation of the ſenſorial power of aſſociation is produced; which afterwards actuates the heart and arteries with unnatural vigour; or unleſs

unlefs there be fome ftimulus perpetually acting on the fyftem, fo as to induce an increafed fecretion of fenforial power in the brain, as occurs in flight degrees of intoxication. Since without one or other of thefe circumftances in continued fevers without inflammation, that is, without the additional fenforial power of fenfation being introduced, it feems difficult to account for the production of fo great a quantity of fenforial power, as muft be neceffary to give perpetual increafe of action to the whole fanguiferous fyftem.

3. On the contrary, while the cutaneous capillaries with their mucous and perfpirative glands acquire an increafed irritability, as above, by the accumulation of that fenforial power during their previous quiefcence, and thus conftitute the hot fit of fever; if the heart and arteries do not acquire any increafe of affociability, but continue in their ftate of torpor, another kind of fimple fever is produced; which is generally of the continued kind, and is termed Febris inirritativa; which confifts of a previous torpor of the capillaries of the fkin, and of the heart and arteries by direct fympathy with them; and afterwards of an orgafm or increafed action of the capillaries of the fkin, with a decreafed action, or continued torpor, of the heart and arteries by reverfe fympathy with them. This orgafm of the cutaneous capillaries, which appears by the blufh and heat of the fkin, is at firft owing to the accumulation of the fen-

 forial

ſorial power of irritation during their previous torpid ſtate, as in the febris irritata above deſcribed; but which is afterwards ſupported or continued by the reverſe ſympathy of theſe capillaries with the torpid ſtate of the heart and arteries, as will be further explained in article 8 of this Supplement.

4. The renovated activity of the capillaries commences as ſoon or ſooner than that of the heart and arteries after the cold fit of irritative fever; and is not owing to their being forced open by the blood being impelled into them mechanically, by the renovated action of the heart and arteries; for theſe capillaries of the ſkin have greater mobility than the heart and arteries, as appears in the ſudden bluſh of ſhame; which may be owing to their being more liable to perpetual varieties of activity from their expoſure to the viciſſitudes of atmoſpheric heat. And becauſe in inirritative fevers, or thoſe with arterial debility, the capillaries acquire increaſed ſtrength, as is evinced by the heat of the ſkin, while the pulſations of the heart and arteries remain feeble.

5. It was ſaid above, that the cutaneous capillaries, when they were rendered torpid by expoſure to cold, either recovered their activity by the reapplication of external warmth; or by their increaſed

increaſed irritability, which is cauſed by the accumulation of that ſenſorial power during their quieſcence. An example of the former of theſe may be ſeen on emerging from a very cold bath; which produces a fit of ſimple fever; the cold fit, and conſequent hot fit, of which may be prolonged by continuing in the bath; which has indeed proved fatal to ſome weak and delicate people, and to others after having been much exhauſted by heat and exerciſe. See Sect. XXXII. 3. 2. An example of the latter may be taken from going into a bath of about eighty degrees of heat, as into the bath at Buxton, where the bather firſt feels a chill, and after a minute becomes warm, though he remains in the ſame medium, owing to the increaſe of irritability from the accumulation of that ſenſorial power during the ſhort time which the chilneſs continued.

6. Hence ſimple fevers are of two kinds; firſt, the febris irritativa, or fever with ſtrong pulſe; which conſiſts of a previous torpor of the heart, arteries, and capillaries, and a ſucceeding orgaſm of thoſe veſſels. Secondly, the febris inirritativa, or fever with weak pulſe, which conſiſts of a previous torpor of the heart, arteries, and capillaries; and of a ſucceeding orgaſm of the capillaries, the torpor of the heart and arteries continuing. But as the frequency of the pulſe occurs both in the ſtate of torpor, and in that of orgaſm, of the heart

and arteries; this conſtitutes a criterion to diſtinguiſh fever from other diſeaſes, which are owing to the torpor of ſome parts of the ſyſtem, as pareſis, and hemicrania.

7. The reader will pleaſe to obſerve, that where the cutaneous or pulmonary capillaries are mentioned, their mucous and perſpirative glands are to be underſtood as included; but that the abſorbents belonging to thoſe ſyſtems of veſſels, and the commencement of the veins, are not always included; as theſe are liable to torpor ſeparately, as in anaſarca, and petechiæ; or to orgaſm, or increaſed action, as in the exhibition of ſtrong emetics, or in the application of vinegar to the lips; yet he will alſo pleaſe to obſerve, that an increaſed or decreaſed action of theſe abſorbents and veins generally occurs along with that of the capillaries, as appears by the dry ſkin in hot fits of fever; and from there being generally at the ſame time no accumulation of venous blood in the cutaneous veſſels, which would appear by its purple colour.

II. *Compound Fever.*

1. When other parts of the ſyſtem ſympathize with this torpor and orgaſm of the cutaneous capillaries, and of the heart and arteries; the fever-fit becomes more complicated and danger-

ous;

ous; and this in proportion to the number and consequence of such affected parts. Thus if the lungs become affected, as in going into very cold water, a shortness of breath occurs; which is owing to the collapse or inactivity (not to the active contraction, or spasm), of the pulmonary capillaries; which, as the lungs are not sensible to cold, are not subject to painful sensation, and consequent shuddering, like the skin. In this case after a time the pulmonary capillaries, like the cutaneous ones, act with increased energy; the breathing, which was before quick, and the air thrown out at each respiration in less quantity, and cool to the back of the hand opposed to it, now becomes larger in quantity, and warmer than natural; which however is not accompanied with the sensation of heat in the membrane, which lines the air-vessels of the lungs, as in the skin.

2. One consequence of this increased heat of the breath is the increased evaporation of the mucus on the tongue and nostrils. A viscid material is secreted by these membranes to preserve them moist and supple, for the purposes of the senses of taste and of smell, which are extended beneath their surfaces; this viscid mucus, when the aqueous part of it is evaporated by the increased heat of the respired air, or is absorbed by the too great action of the mucous absorbents, adheres

clofely on thofe membranes, and is not without difficulty to be feparated from them. This drynefs of the tongue and noftrils is a circumftance therefore worthy to be attended to; as it fhews the increafed action of the pulmonary capillaries, and the confequent increafed heat of the expired air; and may thus indicate, when colder air fhould be admitted to the patient. See Clafs I. 1. 3. 1. The middle part of the tongue becomes dry fooner, and recovers its moifture later, than the edges of it; becaufe the currents of refpired air pafs moft over the middle part of it. This however is not the cafe, when the drynefs of the tongue is owing only to the increafed mucous abforption. When however a frequent cough attends pulmonary inflammation, the edges of the tongue are liable to be as much furred as the middle of it; as during the action of coughing the middle of the tongue is depreffed, fo as to form half a cylinder, to give a greater aperture for the emiffion of air from the larynx; and the edges of it become thus as much expofed to the currents of air, as the middle parts of it.

3. When the internal capillaries or glands fympathize with the cutaneous capillaries; or when any of them are previoufly affected with torpor, and the external or cutaneous capillaries are affected fecondarily; other fymptoms are produced, which render the paroxyfms of fever ftill more

more complicate. Thus if the ſpleen or pancreas are primarily or ſecondarily affected, ſo as to be rendered torpid or quieſcent, they are liable to become enlarged, and to remain ſo even after the extinction of the fever-fit. Theſe in ſome intermittent fevers are perceptible to the hand, and are called ague-cakes; their tumour ſeems to be owing to the permanent torpor of the abſorbent ſyſtem, the ſecerning veſſels continuing to act ſome time afterwards. If the ſecretory veſſels of the liver are affected firſt with torpor, and afterwards with orgaſm, a greater ſecretion of bile is produced, which ſometimes cauſes a diarrhœa. If a torpor of the kidneys, and of the abſorbents of the bladder occurs, either primarily, or by ſympathy with the cutaneous capillaries, the urine is in ſmall quantity and pale, as explained in Claſs I. 2. 2. 5.; and if theſe ſecretory veſſels of the kidneys, and the abſorbents of the bladder act more ſtrongly than natural afterwards by their increaſed irritability or aſſociability, the urine becomes in larger quantity, and deeper coloured, or depoſits its earthy parts, as in Claſs I. 1. 2. 4. which has been eſteemed a favourable circumſtance. But if the urine be in ſmall quantity, and no ſediment appears in it, after the hot fit is over; it ſhews that the ſecerning veſſels of the kidneys and the abſorbent veſſels of the bladder have not regained the whole of their activity,

and thence indicates a greater tendency to a return of the cold fit.

4. When the ſtomach is affected with torpor either primarily; or ſecondarily by its ſympathy with the cutaneous capillaries; or with ſome internal viſcus; ſickneſs occurs, with a total want of appetite to any thing ſolid; vomiting then ſupervenes, which may often be relieved by a bliſter on the ſkin, if the ſkin be cool and pale; but not if it be hot and fluſhed. The inteſtines ceaſe to perform their office of abſorption from a ſimilar torpor; and a diarrhœa ſupervenes owing to the acrimony of their putrid, or of their acid contents. The looſe undigeſted or fetid ſtools indicate the inability of the inteſtines to perform their proper office; as the mucus and gaſtric acid, which are vomited up, does that of the ſtomach; this torpor of the ſtomach is liable to continue after the cold paroxyſm ceaſes, and to convert intermittent fevers into continued ones by its direct ſympathy with the heart and arteries. See article 10 of this Supplement.

5. If the meninges of the brain ſympathize with other torpid parts, or are primarily affected, delirium, ſtupor, and perhaps hydrocephalus internus, occur, ſee Claſs II. 1. 7. 1. and I. 2. 5. 10; and ſometimes the pulſe becomes ſlow, producing

pareſis

pareſis inſtead of fever. But if the membranes, which cover the muſcles about the head, or of the pericranium, become torpid by their ſympathy with other torpid parts, or are primarily affected, a head-ach ſupervenes; which however generally ceaſes with the cold paroxyſm of fever. For as when the ſenſorial power of volition is exhauſted by labour, a few hours, or half a ſolar day, paſſed in ſleep recruits the ſyſtem by accumulation of this ſenſorial power; ſo when the ſenſorial power of irritation is exhauſted, one or two ſolar or lunar days of reſt or quieſcence of the affected part will generally reſtore its action by accumulation of irritability, and conſequent increaſe of aſſociation, as in hemicrania, Claſs IV. 2. 2. 8. But when the heart and arteries become torpid, either primarily, or by their ſympathy with the ſtomach, this accumulation of the ſenſorial power of irritation can take place but ſlowly; *as to reſt is death!* This explains the cauſe of the duration of fevers with weak pulſe, which continue a quarter, or half, or three quarters, or a whole lunation, or ſtill longer, before ſufficient accumulation of irritability can be produced to reſtore their natural ſtrength of action.

6. If the abſorbent veſſels, which are ſpread around the neck of the bladder, become torpid by their direct ſympathy with the abſorbents of the ſkin in cold fits of fever; the urine, which is poured

poured into the bladder in but ſmall quantity from the torpid kidneys, has nevertheleſs none of its aqueous ſaline part reabſorbed; and this ſaline part ſtimulates the bladder to empty itſelf frequently, though the urine is in ſmall quantity. Which is not therefore owing to any ſuppoſed ſpaſm of the bladder, for the action of it in excluding the urine is weak, and as much controllable by the will as in ordinary micturition.

7. If the beginnings or abſorbent mouths of the venous ſyſtem remain torpid, petechiæ or vibices are produced in fevers, ſimilar to thoſe which are ſeen in ſcurvy without fever. If the ſkin was frequently moiſtened for an hour, and at the ſame time expoſed to the common air, or to oxygen gas, it might contribute to turn the black colour of theſe points of extravaſated blood into ſcarlet, and thus by increaſing its ſtimulus facilitate its reabſorption? For oxygen gas penetrates moiſt animal membranes though not dry ones, as in the lungs during reſpiration. See Claſs I. 2. 1. 17.

8. When the ſenſorial power of ſenſation is introduced into the arterial ſyſtem, other kinds of compound fevers are produced, which will be ſpoken of in their place.

III. *Termination*

III. *Termination of the cold Fit.*

1. If all the parts, which were affected with torpor, regain their irritability, and aſſociability, the cold paroxyſm of fever ceaſes; but as ſome of the parts affected were previouſly accuſtomed to inceſſant action, as the heart and arteries, and others only to intermitted action, as the ſtomach and inteſtines; and as thoſe, which are ſubjected during health to perpetual action, accumulate ſenſorial power faſter, when their motions are impeded, than thoſe which are ſubjected to intermitted action; it happens, that ſome of the parts, which were affected with torpor during the cold fit, recover their irritability or aſſociability ſooner than others, and more perfectly, or acquire a greater quantity of them than natural; as appears by the partial heat and fluſhings previous to the general hot fit.

Hence if all the parts, which were previouſly torpid, regain their due degree of irritability, or of aſſociability, the diſeaſe is removed, and health reſtored. If ſome or all of them acquire more than their natural degree of theſe ſenſorial powers; increaſed actions, and conſequent increaſed ſecretions, and greater heat occur, and conſtitute the hot fit of fever. If after this hot fit of fever all the parts, which had acquired too great irritability, or aſſociability, regain their natural degree

of

of it; the diſeaſe is removed, and health reſtored. But if ſome of theſe parts do not regain their natural degree of theſe ſenſorial powers, the actions of thoſe parts remain imperfect, and are more or leſs injurious to the ſyſtem, according to the importance of their functions.

2. Thus if a torpor of the heart and arteries remains; the quick pulſe without ſtrength, which began in the cold fit, perſiſts; and a continued fever is produced. If the torpor of the ſtomach and inteſtines remains, which is known by ſickneſs and undigeſted ſtools, the fever is liable to be of conſiderable length and danger; the ſame if the kidneys and abſorbent ſyſtem retain ſome degree of torpor, as is ſhewn by the pale urine in not unuſual quantity. If part of the abſorbent ſyſtem remains torpid, as the abſorbent veſſels of the ſpleen, a tumour of that viſcus occurs, which may be felt by the hand; the ſame ſometimes happens to the liver; and theſe from their tendency to more complete torpor are afterwards liable to give occaſion to a return of the cold fit. If the cellular abſorbents do not completely recover their activity, a pale and bloated countenance with ſwelled legs marks their want of action.

3. As the termination of the cold fit is owing to the accumulation of the ſenſorial power of

irritation

irritation and of aſſociation during the previous quieſcence of the ſyſtem; and as thoſe parts, which are in perpetual action during health, are more ſubject to this accumulation during their torpor, or quieſcence; one ſhould have imagined, that the heart and arteries would acquire this accumulation of ſenſorial power ſooner or in greater degree than other parts. This indeed ſo happens, where the pulſe is previouſly ſtrong, as in febris irritativa; or where another ſenſorial power, as that of ſenſation, is exerted on the arterial ſyſtem, as in inflammations. The heart and arteries in theſe caſes ſoon recover from their torpor, and are exerted with great violence.

Many other parts of the ſyſtem ſubject to perpetual motion in health may reſt for a time without much inconvenience to the whole; as when the fingers of ſome people become cold and pale; and during this complete reſt great accumulation of irritability may be produced. But where the heart and arteries are previouſly feeble, they cannot much diminiſh their actions, and certainly cannot reſt entirely, for that would be death; and therefore in this caſe their accumulation of the ſenſorial power of irritation or of aſſociation is ſlowly produced, and a long fever ſupervenes in conſequence; or ſudden death, as frequently happens, terminates the cold fit.

Whence it appears, that in fevers with weak pulſe, if the action of the heart, arteries, and capillaries

pillaries could be diminiſhed, or ſtopped for a ſhort time without occaſioning the death of the patient, as happens in cold bathing, or to perſons apparently drowned, that a great accumulation of the ſenſorial powers of irritation or of aſſociation might ſoon be produced, and the pulſe become ſtronger, and conſequently ſlower, and the fever ceaſe. Hence cold ablution may be of ſervice in fevers with weak pulſe, by preventing the expenditure and producing accumulation of the ſenſorial power of irritation or aſſociation. Stupor may be uſeful on the ſame account. Could a centrifugal ſwing be ſerviceable for this purpoſe, either by placing the head or the feet in the outward part of the circle, as deſcribed in Art. 15. 7. of this Supplement?

IV. *Return of the cold Fit.*

1. If the increaſed action of the cutaneous and pulmonary capillaries, and of the heart and arteries, in febris irritativa, continues long and with violence, a proportional expenditure or exhauſtion of ſenſorial power occurs; which by its tendency to induce torpor of ſome part, or of the whole, brings on a return of the cold fit.

2. Another cauſe which contributes to induce torpor of the whole ſyſtem by the ſympathy of its

parts with each other, is the remaining torpor of ſome viſcus; which after the laſt cold paroxyſm had not recovered itſelf, as of the ſpleen, liver, kidneys, or of the ſtomach and inteſtines, or abſorbent veſſels, as above mentioned.

3. Other cauſes are the deficiency of the natural ſtimuli, as hunger, thirſt, and want of freſh air. Other cauſes are great fatigue, want of reſt, fear, grief, or anxiety of mind. And laſtly, the influence of external ethereal fluids, as the defect of external heat, and of ſolar or lunar gravitation. Of the latter the return of the paroxyſms of continued fevers about ſix o'clock in the evening, when the ſolar gravitation is the leaſt, affords an example of the influence of it; and the uſual periods of intermittents, whether quotidian, tertian, or quartan, which ſo regularly obey ſolar or lunar days, afford inſtances of the influence of thoſe luminaries on theſe kinds of fevers.

4. If the tendency to torpor of ſome viſcus is conſiderable, this will be increaſed at the time, when the terrene gravitation is greateſt, as explained in the introduction to Claſs IV. 2. 4. and may either produce a cold paroxyſm of quotidian fever; or it may not yet be ſufficient in quantity for that purpoſe, but may nevertheleſs become greater, and continue ſo till the next period of the greateſt terrene gravitation, and may then either produce

produce a paroxyſm of tertian fever; or may ſtill become greater, and continue ſo till the next period of greateſt terrene gravitation, and then produce a paroxyſm of quartan ague. And laſtly, the periodical times of theſe paroxyſms may exceed, or fall ſhort of, the time of greateſt diurnal terrene gravitation according to the time of day, or period of the moon, in which the firſt fit began; that is, whether the diurnal terrene gravitation was then in an increaſing or decreaſing ſtate.

V. *Senſation excited in Fever.*

1. A curious obſervation is related by Dr. Fordyce in his Tract on Simple fever, page 168. He aſſerts, that thoſe people, who have been confined ſome time in a very warm atmoſphere, as of 120 or 130 degrees of heat, do not feel cold, nor are ſubject to paleneſs of their ſkins, on coming into a temperature of 30 or 40 degrees; which would produce great paleneſs and painful ſenſation of coldneſs in thoſe, who had been ſome time confined in an atmoſphere of only 86 or 90 degrees. Analogous to this, an obſerving friend of mine aſſured me, that once having ſat up to a very late hour with three or four very ingenious and humorous companions, and drunk a conſiderable quantity of wine; both contrary to his uſual habits of life; and being obliged

to rife early, and to ride a long journey on the next day; he expected to have found himfelf weak and foon fatigued; but on the contrary he performed his journey with unufual cafe and alacrity; and frequently laughed, as he rode, at the wit of the preceding evening. In both thefe cafes a degree of pain or pleafure actuated the fyftem; and thus a fenforial power, that of fenfation, was fuperadded to that of irritation, or volition. See Sect. XXXIV. 2. 6.

2. Similar to this, when the energetic exertions of fome parts of the fyftem in the hot fit of fever arife to a certain excefs, a degree of fenfation is produced; as of heat, which particularly increafes the actions of the cutaneous veffels, which are more liable to be excited by this ftimulus. When this additional fenforial power of fenfation exifts to a greater degree, the pulfe, which was before full, now becomes hard, owing to the inflammation of the vafa vaforum, or coats of the arteries. In thefe cafes, whether there is any topical inflammation or not, the fever ceafes to intermit; but nevertheleefs there are daily remiffions and exacerbations of it; which recur for the moft part about fix in the evening, when the folar gravitation is the leaft, as mentioned in Sect. XXXVI. 3. 7.

3. Thus the introduction of another ſenſorial power, that of ſenſation, converts an intermittent fever into a continued one. If it be attended with ſtrong pulſe, it is termed febris ſenſitiva irritata, or pyrexia, or inflammation; if with a weak pulſe, it is termed febris ſenſitiva inirritata, or typhus gravior, or malignant fever. The ſeat of the inflammation is in the glandular or capillary ſyſtem, as it conſiſts in the ſecretion of new fluids, or new fibres, which form new veſſels, as they harden, like the ſilk of the ſilk-worm. See Art 15. of this Supplement.

VI. *Circles of irritative Aſſociate Motions.*

1. There are ſome aſſociate motions, which are perpetually proceeding in our waking hours, and are catenated by their firſt link, or in ſome ſubſequent parts of the chain, with the ſtimuli or the influence of external things; which we ſhall here enumerate, as they contribute to the knowledge of fever. Of theſe are the irritative ideas, or ſenſual motions of the organs of ſenſe, and the muſcular motions aſſociated with them; which, when the chain is diſturbed or interrupted, excite the ſenſorial power of ſenſation, and proceed in confuſion. Thus if the irritative ideas of ſight are diſturbed, the parallactic motions of objects,

which

which in general are unperceived, become ſenſible to us; and the locomotive muſcles aſſociated with them, which ought to preſerve the body erect, ſtagger from this decreaſe or interruption of the ſenſorial power of aſſociation; and vertigo is produced.

When the irritative ſenſual motions, or ideas, belonging to one ſenſe are increaſed or diminiſhed, the irritative ſenſual motions, or ideas, of the other ſenſes are liable to become diſturbed by their general catenations; whence occur noiſes in the ears, bad taſtes in the mouth, bad odours, and numbneſs or tingling of the limbs, as a greater or leſs number of ſenſes are affected. Theſe conſtitute concomitant circles of diſturbed irritative ideas; or make a part of the great circle of irritative ideas, or motions of the organs of ſenſe; and when thus diſturbed occaſion many kinds of hallucination of our other ſenſes, or attend on the vertigo of viſion.

2. Another great circle of irritative aſſociated motions conſiſts of thoſe of the alimentary canal; which are catenated with ſtimuli or with influences external to the ſyſtem, but continue to be exerted in our ſleeping as well as in our waking hours. When theſe aſſociations of motion are diſturbed by the too great or too ſmall ſtimulus of the food taken into the ſtomach, or by the too

great excefs or deprivation of heat, or by indigeftible fubftances, or by torpor or orgafm occafioned by their affociation with other parts, various difeafes are induced under the names of apepfia, hypochondriafis, hyfteria, diarrhœa, cholera, ileus, nephritis, fever.

3. A third circle of irritative affociate motions confifts of thofe of the abforbent fyftem; which may be divided into two, the lacteals, and the lymphatics. When the ftomach and inteftines are recently filled with food and fluid, the lacteal fyftem is ftimulated into great action; at the fame time the cellular, cutaneous, and pulmonary lymphatics act with lefs energy; becaufe lefs fluid is then wanted from thofe branches, and becaufe more fenforial power is expended by the lacteal branch. On this account thefe two fyftems of abforbents are liable to act by reverfe fympathy; hence pale urine is made after a full dinner, as lefs of the aqueous part of it is imbibed by the urinary lymphatics; and hence the water in anafarca of the lungs and limbs is fpeedily abforbed, when the actions of the lacteals of the ftomach or inteftines are weakened or inverted by the exhibition of thofe drugs, which produce naufea, or by violent vomiting, or violent cathartics.

Hence in diabetes the lacteal fyftem acts ftrongly,

ſtrongly, at the ſame time that the urinary lymphatics invert their motions, and tranſmit the chyle into the bladder; and in diarrhœa from crapula, or too great a quantity of food and fluid taken at a time, the lacteals act ſtrongly, and abſorb chyle or fluids from the ſtomach and upper inteſtines; while the lymphatics of the lower inteſtines revert their motions, and tranſmit this over-repletion into the lower inteſtines, and thus produce diarrhœa; which accounts for the ſpeedy operation of ſome cathartic drugs, when much fluid is taken along with them.

4. Other circles of irritative aſſociate motions of great importance are thoſe of the ſecreting ſyſtem; of theſe are the motions of the larger congeries of glands, which form the liver, ſpleen, pancreas, gaſtric glands, kidneys, ſalivary glands, and many others; ſome of which act by direct and others by reverſe ſympathy with each other. Thus when the gaſtric glands act moſt powerfully, as when the ſtomach is filled with food, the kidneys act with leſs energy; as is ſhewn by the ſmall ſecretion of urine for the firſt hour or two after dinner; which reverſe ſympathy is occaſioned by the greater expenditure of ſenſorial power on the gaſtric glands, and to the newly abſorbed fluids not yet being ſufficiently animalized,

or otherwiſe prepared, to ſtimulate the ſecretory veſſels of the kidneys.

But thoſe very extenſive glands, which ſecrete the perſpirable matter of the ſkin and lungs, with the mucus, which lubricates all the internal cells and cavities of the body, claim our particular attention. Theſe glands, as well as all the others, proceed from the capillary veſſels which unite the arteries with the veins, and are not properly a part of them; the mucous and perſpirative glands, which ariſe from the cutaneous and pulmonary capillaries, are aſſociated by direct ſympathy; as appears from immerſion in the cold bath, which is therefore attended with a temporary difficult reſpiration; while thoſe from the capillaries of the ſtomach and heart and arteries are more generally aſſociated by reverſe ſympathy with thoſe of the cutaneous capillaries; as appears in fevers with weak pulſe and indigeſtion, and at the ſame time with hot and dry ſkin.

The diſturbed actions of this circle of the aſſociate motions of the ſecerning ſyſtem, when the ſenſorial power of ſenſation is added to that of irritation, frequently produces inflammation, which conſiſts in the ſecretion of new fluids or new veſſels. Nevertheleſs, if theſe diſturbed actions be of the torpid kind, the pain, which attends them, is ſeldom productive of inflammation, as in hemicrania; but is liable to excite voluntary actions,

and

and thus to expend much ſenſorial power, as in the ſhuddering in cold fits of fever, or in convulſions; or laſtly the pain itſelf, which attends torpid actions, is liable to expend or exhauſt much ſenſorial power without producing any increaſed actions; whence the low pulſe, and cold extremities, which uſually attend hemicrania; and hence when inert, or inactive ſenſation attends one link of aſſociated action, the ſucceeding link is generally rendered torpid, as a coldneſs of the cheek attends tooth-ach.

5. A fifth important circle of irritative motions is that of the ſanguiferous ſyſtem, in which the capillary veſſels are to be included, which unite the arterial and venous ſyſtems, both pulmonary and aortal The diſturbed action of this ſyſtem of the heart and arteries, and capillaries, conſtitutes ſimple fever; to which may be added, that the ſecerning and abſorbent veſſels appending to the capillaries, and the bibulous mouths of the veins, are in ſome meaſure at the ſame time generally affected.

6. Now, though the links of each of theſe circles of irritative motions are more ſtrictly aſſociated together, yet are they in greater or leſs degree aſſociated or catenated with each other by direct or reverſe ſympathy. Thus the

ſickneſs, or inverted irritative motions of the ſtomach, are aſſociated or catenated with the diſturbed irritative ideas, or ſenſual motions, in vertigo; as in ſea-ſickneſs. This ſickneſs of the ſtomach is alſo aſſociated or catenated with the torpor of the heart and arteries by direct ſympathy, and with the capillaries and abſorbents by reverſe ſympathy; and are thus all of them liable occaſionally to be diſturbed, when one of them is diſeaſed; and conſtitute the great variety of the kinds or ſymptoms of fevers.

VII. *Alternation of the cold and hot Fits.*

1. When any cauſe occurs, which diminiſhes to a certain degree the ſupply of ſenſorial power in reſpect to the whole ſyſtem; as ſuppoſe a temporary inexertion of the brain; what happens? Firſt, thoſe motions are exerted with leſs energy, which are not immediately neceſſary to life, as the locomotive muſcles; and thoſe ideas, which are generally excited by volition; at the ſame time this deficiency of voluntary motion is different from that which occurs in ſleep; as in that the movements of the arterial ſyſtem are increaſed in energy though not in frequency. Next, the motions of the alimentary canal become performed with leſs energy, or ceaſe altogether; and a total want of appetite to ſolid food occurs, or ſickneſs, or a diarrhœa occaſioned by the indi-

geſted

geſted aliment. Then the abſorbent veſſels ceaſe to act with their due energy; whence thirſt, and pale urine, though in ſmall quantities. Fourthly, the ſecerning veſſels become affected by the general diminution of ſenſorial power; whence all the ſecreted fluids are produced in leſs quantity. And laſtly, the ſanguiferous canals feel the general torpor; the pulſations of the heart and arteries become feeble, and conſequently quick; and the capillaries of the ſkin become inactive, acquire leſs blood from the arteries, and are conſequently paler and ſhrunk.

In this laſt circumſtance of the torpor of the ſanguiferous ſyſtem conſiſts inirritative fever; as all the others are rather accidental or concomitant ſymptoms, and not eſſential ones; as fewer or more of them may be preſent, or may exiſt with a greater or leſs degree of inactivity.

2. Now as the capillaries of the ſkin are expoſed to greater varieties of heat and cold, than the heart and arteries, they are ſuppoſed to be more mobile, that is, more ſuſceptible of torpor or exertion, or to inflammation, by external ſtimuli or influences, than the other parts of the ſanguiferous ſyſtem; and as the ſkin is more ſenſible to the preſence of heat, than the internal parts of the body, the commencement of the cold paroxyſms of fever generally either firſt exiſts in, or is firſt perceived by, the coldneſs and paleneſs

neſs of the ſkin; and the commencement of the hot fits by the heat and redneſs of it.

3. The accumulation of ſenſorial power occurs in theſe organs ſooneſt, and in greateſt quantity, during their quieſcence, which were moſt perpetually in action during health; hence thoſe parts of the ſyſtem ſooneſt recover from torpor in intermittent fever, and ſooneſt fall into the contrary extreme of increaſed activity; as the ſanguiferous ſyſtem of the heart and arteries and capillaries. But of theſe the capillaries ſeem firſt to acquire a renovation of their action, as the heat of the ſkin becomes firſt renewed, as well as increaſed beyond its natural quantity, and this in ſome parts ſooner than in others; which quantity of heat is however not to be eſtimated ſimply by the riſe of the mercury in the thermometer, but alſo by the quantity carried away into the atmoſphere, or diffuſed amongſt other bodies in a given time; as more heat paſſes through water, which boils vehemently, than when it boils gently, though the riſe of the thermometer in both caſes continues the ſame. This fact may be known by boiling an egg in water, the white of which coagulates in much leſs time, if the water boils vehemently, than if it boils moderately, though the ſenſible heat of the water is the ſame in both caſes.

Another cauſe, which induces the cutaneous capillaries

capillaries to renew their actions ſooner than the heart and arteries after immerſion in the cold bath, is, that their torpor was occaſioned by defect of irritation: whereas that of the heart and arteries was occaſioned by defect of aſſociation; which defect of aſſociation was owing to the decreaſed actions of the capillaries, and is now again excited by their renewed action: which excitement muſt therefore be ſubſequent to that increaſed action of the capillaries; and in conſequence the increaſed action of the heart and arteries at the commencement of the hot fit of ſome fevers is ſubſequent to the increaſed action of the cutaneous capillaries. There is, however, in this caſe an accumulation of the ſenſorial power of aſſociation in the heart and arteries, which muſt contribute to increaſe their orgaſm in the hot fit, as well as the increaſed excitement of it by the increaſed action of the capillaries.

4. Now this increaſed action of the ſyſtem, during the hot fit, by exhauſting the ſenſorial powers of irritation and aſſociation, contributes to induce a renewal of the cold paroxyſm; as the accumulation of thoſe ſenſorial powers in the cold fit produces the increaſed actions of the hot fit; which two ſtates of the ſyſtem reciprocally induce each other by a kind of libration, or a plus and minus, of the ſenſorial powers of irritation and aſſociation.

If the exhauſtion of ſenſorial power during the hot

hot fit of fever only reduces the quantity of irritability and aſſociability to its natural ſtandard, the fever is cured, not being liable to return. If the quantity of theſe ſenſorial powers be reduced only ſo much, as not to produce a ſecond cold fit during the preſent quantity of external ſtimuli or influences; yet it may be ſo far reduced, that a very ſmall ſubtraction of ſtimulus, or of influence, may again induce a cold fit; ſuch as the coldneſs of the night-air, or the diminution of ſolar or lunar gravation, as in intermittent fevers.

5. Another cauſe of the renovation of the cold fits of fever is from ſome parts of the ſyſtem not having completely recovered from the former cold paroxyſm; as happens to the ſpleen, liver, or other internal viſcus; which ſometimes remains tumid, and either occaſions a return of the cold fit by direct ſympathy with other parts of the body, or by its own want of action cauſes a diminution of the general quantity of heat, and thus facilitates the renovation of the torpor of the whole ſyſtem, and gives cauſe to intermittent fevers catenated with lunar or ſolar influence.

VIII. *Orgaſm of the Capillaries.*

As the remaining torpor of ſome leſs eſſential part of the ſyſtem, as of the ſpleen, when the hot fit ceaſes, produces after one, two, or three days a return of cold fit by direct ſympathy with the cutaneous

cutaneous capillaries, when joined with ſome other cauſe of torpor, as the defect of ſolar or lunar influences, or the expoſure to cold or hunger, and thus gives origin to intermittent fever; ſo the remaining torpor of ſome more eſſential parts of the ſyſtem, as of the ſtomach and inteſtines, is probably the cauſe of the immediate recurrence of the cold paroxyſm, at the time the hot one ceaſes, by their direct ſympathy with the cutaneous capillaries, without the aſſiſtance of any other cauſe of torpor; and thus produces remittent fever. And laſtly the remaining torpor of ſome ſtill more eſſential parts of the ſyſtem, as the heart and arteries, after the hot fit ought to ceaſe, is liable by reverſe ſympathy with the cutaneous capillaries to continue their orgaſm, and thus to render a fever continual, which would otherwiſe remit or intermit.

Many difficulties here occur, which we ſhall endeavour to throw ſome light upon, and leave to future inveſtigation; obſerving only that difficulties were to be expected, otherwiſe fevers would long ſince have been underſtood, as they have employed the unremitted attention of the phyſicians of all ages of the world.

1. Why do the ſame parts of ſucceſſive trains of action ſometimes affect each other by direct, and ſometimes by reverſe ſympathy?—1ſt, When any irritative motion ceaſes, or becomes torpid, which

was before in perpetual action; it is either deprived of its usual stimulus, and thence the sensorial power of irritation is not excited; or it has been previously too much stimulated, and the sensorial power has been thus exhausted.

In the former case an accumulation of sensorial power soon occurs, which is excitable by a renewal of the stimulus; as when the fingers, which have been immersed some time in snow, are again exposed to the usual warmth of a room. Or, secondly, the sensorial power of irritation becomes so much accumulated, that the motions, which were torpid, are now performed by less stimulus than natural; as appears by the warmth, which soon occurs after the first chill in going into frosty air, or into the bath at Buxton, which is about eighty degrees of heat. Or, lastly, this accumulation of the sensorial power of irritation so far abounds, that it increases the action of the next link of the associated train or tribe of motions; thus on exposing the skin to cold air, as in walking out in a frosty morning, the actions of the stomach are increased, and digestion strengthened.

But where the torpor of some irritative motion is owing to the previous exhaustion of the sensorial power of irritation by too great stimulus, the restoration of it occurs either not at all, or much more slowly than in the former instances; thus after intoxication the stomach is very slow

in

in recovering its due quantity of the ſenſorial power of irritation, and never ſhews any accumulation of it.

2. When an aſſociate motion, as deſcribed in the introduction to Claſs IV. 1. 1. acts with leſs energy, the ſenſorial power of aſſociation is either not ſufficiently excited by the preceding fibrous motions; or it has been expended or exhauſted by the too violent actions of the preceding fibrous motions. In the former caſe there occurs an accumulation of the ſenſorial power of aſſociation; exactly as, where the uſual ſtimulus is withdrawn, there occurs an accumulation of the ſenſorial power of irritation. Thus when the actions of the capillaries of the ſkin are diminiſhed by immerſion in cold water, the capillaries of the lungs are rendered torpid by the want of the excitement of the ſenſorial power of aſſociation, owing to the leſſened actions of the previous fibrous motions, namely, of thoſe of the ſkin. Nevertheleſs as ſoon as the capillaries of the ſkin regain their increaſed activity by the accumulation of the ſenſorial power of irritation, theſe capillaries of the lungs act with greater energy alſo owing to their accumulated ſenſorial power of aſſociation. Theſe are inſtances of direct ſympathy, and conſtitute the cold and hot paroxyſms of intermittent fever; or the firſt paroxyſm of a continued one.

3. When

3. When the firſt link of a train of aſſociated motions, which is ſubject to perpetual action, becomes a conſiderable time torpid for want of being excited by the previous exertions of the irritative motions, with which it is catenated; the ſenſorial power of aſſociation becomes accumulated in ſo great a degree as to affect the ſecond link of the train of aſſociated motions, and to excite it into ſtronger action. Thus when the ſtomach is rendered torpid by contagious matter ſwallowed into it mixed with the ſaliva, the heart and arteries act more feebly; becauſe the ſenſorial power of aſſociation, which uſed to be excited by the fibrous motions of the ſtomach, is not now excited; and in conſequence the motions of the heart and arteries act only by the ſenſorial power of irritation, which is excited by the ſtimulus of the blood.

But during this torpor of the ſtomach, and leſs action of the heart and arteries, ſo great an accumulation of the ſenſorial powers of irritation and of aſſociation occurs, that it adds to the action of the next link of this vital circle of actions, that is, to that of the cutaneous capillaries. Whence in this ſituation the torpor of the ſtomach occaſions a diminiſhed action of the heart and arteries by direct ſympathy, and may be ſaid to occaſion an increaſed one of the cutaneous capillaries by reverſe ſympathy; which conſtitute continued fever with weak pulſe.

Nor

Nor is this increaſed action of the capillaries in conſequence of the decreaſed action of the heart and arteries, as in fevers with weak pulſe, a ſingle fact in the animal economy; though it exiſts in this caſe in the greateſt degree or duration, becauſe the heart and arteries are perpetually in greater action than any other part of the ſyſtem. But a ſimilar circumſtance occurs, when the ſtomach is rendered inactive by defective excitement of the ſenſorial power of aſſociation, as in ſeaſickneſs, or in nephritis. In theſe caſes the ſenſorial power of aſſociation becomes much accumulated in the ſtomach, and ſeems by its ſuperabundance to excite the abſorbent ſyſtem, which is ſo nearly connected with it, into great increaſe of action; as is known by the great quantity frequently in theſe ſituations rejected by vomit, which could not otherways be ſupplied. It is probable the increaſe of digeſtion by walking in froſty air, with many other animal facts, may by future obſervations be found to be dependent on this principle, as well as the increaſed action of the capillaries in continued fevers with weak pulſe.

Whereas in continued fever with ſtrong pulſe, which may perhaps occur ſometimes on the firſt day even of the plague, the ſtomach with the heart and arteries and the capillaries act by direct ſympathy; that is, the ſtomach is excited into ſtronger action by increaſed irritation owing to

the ſtimulus of contagious matter; theſe ſtronger irritative motions of the ſtomach excite a greater quantity of the ſenſorial power of aſſociation, which then actuates the heart and arteries with greater energy, as theſe are catenated with the ſtomach; and in the ſame manner the increaſed actions of the heart and arteries excite a greater quantity of the ſenſorial power of aſſociation, which actuates the cutaneous capillaries with increaſe of energy. See Claſs IV. 1. 1.

4. I ſhall dwell a little longer on this intricate ſubject. The commencement of fever-fits is known by the inactivity of the cutaneous capillaries, which inactivity is obſervable by the paleneſs and coldneſs of the ſkin, and alſo by the pain of coldneſs, which attends it. There is nevertheleſs in moſt caſes, except thoſe which are owing to expoſure to external cold, a torpor of the capillaries of ſome internal viſcus preceding this inactivity of the cutaneous capillaries; which is known by the tumour or hardneſs of the viſcus, or by an aching pain of it. The capillaries of the lungs are at the ſame time rendered inactive or torpid, as appears by the difficulty of breathing, and coldneſs of the breath in cold fits of fever, and in going into the cold bath; but the lungs are not affected with the pain either of coldneſs or of torpor.

One cauſe of this ſynchronous or ſucceſſive in-

activity of the cutaneous capillaries, in consequence of the previous torpor of some internal viscus, may be owing to the deficiency of heat; which must occur, when any part becomes inactive; because the secretions of that part cease or are lessened, and the quantity of heat of it in consequence. But the principal cause of it I suppose to be owing to the defect of the sensorial power of association; which power of association is excited by some previous or concomitant motions of the parts of every great circle of actions. This appears on going into the cold bath, because the shortness of breath instantly occurs, sooner than one can conceive the diminution of the heat of the skin could affect the lungs by the want of its stimulus; but not sooner than the defect of the sensorial power of association could affect them; because this must cease to be excited into action on the instant that the cutaneous capillaries cease to act; whence in the first moment of contact of the cold water the cutaneous capillaries cease to act from defect of irritation; which is caused by defect of the stimulus of heat; and in the second moment the capillaries of the lungs cease to act from the defect of association; which is caused by the defect of the motions of the cutaneous capillaries. Thus the universal torpor in the cold paroxysm of fever is an example of direct sympathy, though occasioned in part by de-

fect of irritation, and in part by defect of affociation.

5. Thus in walking out in a frofty morning the fkin is cooled by the contact of the cold air, whence the actions of its capillaries are diminifhed for want of their ufual ftimulus of heat to excite a fufficient quantity of the fenforial power of irritation. Hence there is at firft a faving of the fenforial power of irritation for the purpofe of actuating the other parts of the fyftem with greater energy. Secondly, the fenforial power of affociation, which ufed to be excited by the motions of the cutaneous capillaries, is now not fo powerfully excited; and in confequence the parts, which conftitute the next links of the circles of affociated motions, are for a time actuated with lefs energy, and a temporary general chillnefs fucceeds; which is fo far fimilar to the cold fit of intermittent fever.

In this fituation there is a curious circumftance occurs, which merits peculiar attention: after a fhort time, though the external fkin continues cool by its expofure to the cold air, and the actions of its capillaries are confequently diminifhed, yet the capillaries of the ftomach act with greater energy; as is known by increafed digeftion and confequent hunger. This is to be afcribed to the accumulation of the fenforial power of irritation, which now excites by its fuperabundance,

abundance, or overflowing, as it were, the ſtomach into increaſed action; though it is at the ſame time excited leſs powerfully than uſual by the ſenſorial power of aſſociation. Thus the accumulation of the ſenſorial power of irritation in the veſſels of the ſkin increaſes in this caſe the action of the ſtomach, in the ſame manner as an accumulation of the ſenſorial power of aſſociation in the heart and arteries in fevers with weak pulſe increaſes the action of the capillaries.

If nevertheleſs the coldneſs of the ſkin be too long continued, or exiſts in too great a degree, ſo as in ſome meaſure to impair the life of the part, no further accumulation of the ſenſorial power of irritation occurs; and in conſequence the actions of the ſtomach become leſs than natural by the defect of the ſenſorial power of aſſociation; which has ceaſed to be excited by the want of action of the cutaneous capillaries. Whence continued coldneſs of the feet is accompanied with indigeſtion and heartburn. See Claſs IV. 2. 1. 6.

6. Similar to this when the actions of the ſtomach are rendered torpid by the previous ſtimulus of a violent emetic, and its motions become retrograde in conſequence, a great quantity of ſenſorial power is exerted on the lymphatics of the lungs, and other parts of the body; which excites them into greater direct action, as is evinced by the exhibition of digitalis in anaſarca. In this

ſituation I ſuppoſe the emetic drug ſtimulates the muſcular fibres of the ſtomach into too great action; and that in conſequence a great torpor ſoon ſucceeds; and that this inaction of the muſcular parts of the ſtomach is not followed by much accumulation of the ſenſorial power of irritation; becauſe that ſenſorial power is in great meaſure exhauſted by the previous exceſſive ſtimulus. But the lymphatics of the ſtomach have their actions leſſened by defect of the ſenſorial power of aſſociation, which is not now excited into action, owing to the leſſened motions of the muſcular parts of it, with which the lymphatics are aſſociated. The ſenſorial power of aſſociation becomes therefore accumulated in theſe lymphatics of the ſtomach, becauſe it is not excited into action; exactly as the power of irritation becomes accumulated in the hand, when immerſed in ſnow; and this accumulated ſenſorial power of aſſociation excites the lymphatics of the lungs and of other parts, which are moſt nearly aſſociated with thoſe of the ſtomach, into more energetic actions. Thus the muſcular fibres of the ſtomach act with the lymphatics of that organ in direct ſympathy; and the lymphatics of the ſtomach act in reverſe ſympathy with thoſe of the lungs and of other parts of the body; the former of which is cauſed by defect of the excitement of the ſenſorial power of aſſociation, and the latter by the accumulation of it.

Beſides the efficient cauſe, as above explained, the

the final cauſe, or convenience, of theſe organic actions are worthy our attention. In this caſe of an acrid drug ſwallowed into the ſtomach the reverted actions of the muſcular fibres of the ſtomach tend to eject its enemy; the reverted actions of its lymphatics pour a great quantity of fluids into the ſtomach for the purpoſe of diluting or waſhing off the noxious drug; and the increaſed actions of the other lymphatics ſupply theſe retrograde ones of the ſtomach with an inconceivable ſupply of fluids, as is ſeen in Ileus and Cholera.

7. The inquiſitive reader will excuſe my continuing this ſubject, though perhaps with ſome repetitions, as it envelopes the very eſſence of fever. When the firſt link of a train of actions is excited by exceſſive ſtimulus, or exceſſive irritability, and thus acts with unuſual energy by the increaſed quantity of irritation, theſe increaſed motions excite a greater quantity of the ſenſorial power of aſſociation, which cauſes increaſed motions in the ſecond link, which is catenated with the firſt; and then the exceſſive action of this ſecond link excites alſo a greater quantity of the ſenſorial power of aſſociation, which increaſes the motions of the third link of this chain of aſſociation, and thus the increaſe of the ſtimulus on the irritative motions, to which the chain of

aſſociation is catenated, increaſes the action of the whole chain or circle of aſſociated motions.

After a time the irritative motions become torpid by expenditure of the ſenſorial power of irritation, and then the power of aſſociation alſo becomes leſs exerted, both becauſe it has been in part exhauſted by too great action, and is now leſs excited by the leſſened action of the irritative motions, which uſed to excite it. Theſe are both inſtances of direct ſympathy, and frequently conſtitute the cold and hot fit of intermittents.

But though the accumulation of the ſenſorial power of irritation during the quieſcence of ſome motion owing to want of ſtimulus generally induces torpor in the firſt link of the train of aſſociated motions catenated with it; as the capillaries of the lungs become torpid immediately on immerſion of the ſkin into cold water; yet in ſome ſituations an orgaſm or exceſs of action is produced in the firſt link of the aſſociated motions thus catenated with irritative ones; as in the increaſed action of the ſtomach, when the ſkin is for a time expoſed to cold air; which may in part be aſcribed to the general increaſe of action of the whole ſyſtem, owing to the diminiſhed expenditure of ſenſorial power, but particularly of the parts, which have habitually acted together; as when one arm is paralytic the other is liable to more frequent or almoſt continual motion;

tion; and when one eye becomes blind the other frequently becomes ſtronger; which is well known to farriers, who are ſaid ſometimes to deſtroy the ſight of one eye to ſtrengthen that of the other in diſeaſed horſes.

Hence there is ſometimes a direct ſympathy, and ſometimes a reverſe one ſucceeds the torpor occaſioned by defect of ſtimulus, the latter of which is perhaps owing to a certain time being required for the production of an accumulation of the ſenſorial power of irritation by the nervous branches of the torpid organ; which accumulation is now in part or entirely derived to the next link of the aſſociation. Thus in going into a coldiſh bath, as into a river in the ſummer months, we at firſt experience a difficulty of breathing from the torpid action of the pulmonary capillaries, owing to the deficient excitement of the ſenſorial power of aſſociation in conſequence of the torpor of the cutaneous capillaries. But in a very ſhort time, as in one minute, the ſenſorial power of irritation becomes accumulated by the inactivity of the cutaneous capillaries; and as its ſuperabundance becomes now expended on the pulmonary capillaries, the difficult reſpiration ceaſes; though the cutaneous capillaries continue torpid by their contact with the cold water, and conſequently the ſenſorial power of aſſociation, which uſed to contribute to actuate the pulmonary capillaries, is leſs excited.

8. In

8. In like manner when there exifts an accumulation of the fenforial power of affociation, owing to defect of its excitement by fome previous irritative or affociate motions, it is generally accompanied for a certain time by a torpor not only of the link firft affected, but of the fubfequent parts, or of the whole train of affociated motions, as in the cold fits of intermittent fevers. Yet after a time an increafed action of the next links of affociated motions fucceeds the torpor of the firft, as the abforbent veffels of the lungs act more violently in confequence of the deficient action of thofe of the ftomach; and the fkin at the commencement of ficknefs is pale and cold, but in a little time becomes flufhed and warm.

Thus we fee in affociate motions, which are rendered torpid by defect of excitement, that fometimes a direct, and fometimes a reverfe fympathy fucceeds in the fubfequent links of the chain. But I believe where a torpor of irritative or of the affociate motions is caufed by a previous too great expenditure or exhauftion of the fenforial powers of irritation or affociation, no increafe of action in the fubfequent link ever occurs, or not till after a very long time.

Thus when the ftomach becomes torpid by previous violent exertion, and confequent exhauftion of the fenforial power of irritation, as after intoxication with wine or opium, or after the exhibition of fome violent emetic drug, the torpor is communicated

municated to the heart and arteries, as in continued fevers with weak pulſe. But where the torpor of the ſtomach is produced from defective aſſociation, as in ſea-ſickneſs; or in the ſickneſs which occurs, when a ſtone ſtimulates the ureter; no torpor is then communicated to the heart and arteries. For in the former caſe there is no accumulation of ſenſorial power in the ſtomach, which was previouſly exhauſted by too great ſtimulus; but in the latter caſe the accumulation of ſenſorial power in the ſtomach during its torpor is evinced by this circumſtance; that in ſea-ſickneſs the patients eat and drink voraciouſly at intervals; and the pulſe is generally not affected by the ſickneſs occaſioned by a ſtone in the ureter. For the action of the ſtomach is then leſſened, and in conſequence becomes retrograde, not owing to the exhauſtion of the ſenſorial power of irritation, but to the want of excitement of the ſenſorial power of aſſociation; which is cauſed by the defective action of the ureter, which becomes occaſionally torpid by the great ſtimulus of the ſtone it contains; or which is cauſed by the great exhauſtion of ſenſorial power by the pain; which affects the ureter without exciting inflammation, or increaſed action of it.

9. Thus though the ſtomach after the great ſtimulus of intoxication from exceſs of wine or opium will continue many hours without accumulation

mulation of ſenſorial power, as appears from the patient's experiencing no appetite at the intervals of ſickneſs; yet after long abſtinence from food, at length not only the exhauſted quantity of ſenſorial power is renewed, but an accumulation of it at length occurs, and hunger returns. In this ſituation the ſtomach is generally about a whole day before it regains its uſual powers of digeſtion; but if it has been ſtill more violently ſtimulated, and its actions further impaired, a ſtill more permanent torpor along with a continued fever with weak pulſe is liable to occur; and a fourth part, or a half, or three-fourths, or a whole lunar period paſſes, before it recovers its due irritability and conſequent action.

In ſimilar manner, after a perſon has been confined in a very warm room for ſome hours, the cutaneous capillaries, with their ſecretory and abſorbent veſſels, become exhauſted of their ſenſorial power of irritation by the too great violent exertions occaſioned by the unuſual ſtimulus of heat; and in coming into a colder atmoſphere an inactivity of the cutaneous veſſels exiſts at firſt for ſome time without accumulation of ſenſorial power; as is ſhewn by the continuance of the pain of cold and the paleneſs; but after a time both the pain of cold and paleneſs vaniſh, which now indicates an accumulation of the ſenſorial power of irritation, as leſs degrees of heat ſtimulate the ſyſtem into due action.

In

In the ſame manner, after any one has been ſome time in the ſummer ſunſhine, on coming into a dark cell he continues much longer before he can clearly diſtinguiſh objects, than if his eyes had only been previouſly expoſed to the light of a cloudy day in winter; becauſe the ſenſorial power of irritation, and conſequent ſenſation, had in the firſt caſe been previouſly much expended or exhauſted; and therefore required a much longer time before it could be produced in the brain, or derived to the optic nerves, in ſuch quantity as to reſtore the deficiency, and to cauſe an accumulation of it; whereas in the latter caſe no deficiency had occurred.

10. Thus the accumulation or deficiency of ſenſorial power in a torpid organ, which had previouſly been accuſtomed to perpetual action, depends on the manner in which it becomes torpid; that is, whether by great previous ſtimulus, or great previous excitement of the power of aſſociation; or by defect of its accuſtomed ſtimulus, or of its accuſtomed excitement of the power of aſſociation. In the former caſe the ſenſorial power is in an exhauſted ſtate, and therefore is not likely to become ſo ſoon accumulated, as after drunkenneſs, or expoſure to great heat, or to great light; in the latter a great accumulation of ſenſorial power occurs, as after expoſure to cold, or hunger, or darkneſs.

Hence when the ſtomach continues torpid by previous violent ſtimulus, as in the exhibition of digitalis, no accumulation of ſenſorial power of irritation ſupervenes; and in conſequence the motions of the heart and arteries, which are aſſociated with thoſe of the ſtomach, become weak, and ſlow, and intermittent, from the defect of the excitement of the ſenſorial power of aſſociation. But what follows? as the actions of the heart and arteries are leſſened by the deficient action of the ſenſorial power of aſſociation, and not by previous increaſed excitement of it; a great accumulation of the ſenſorial power of aſſociation occurs, which is exerted on the pulmonary and cutaneous abſorbents by reverſe ſympathy, and produces a great abſorption of the fluid effuſed into the cellular membrane in anaſarca, with dry ſkin; conſtituting one kind of atrophy.

But if at the ſame time the ſecerning veſſels of the ſtomach are ſtimulated into ſo violent activity as to induce great conſequent torpor, as probably happens when contagious matter is ſwallowed into the ſtomach with our ſaliva, thoſe of the heart and arteries act feebly from the deficient excitement of the power of aſſociation; and then the cutaneous and pulmonary ſecerning veſſels act with greater force than natural, owing to the accumulation of the ſenſorial power of aſſociation; and unnatural heat of the ſkin, and of the breath

ſucceed;

ſucceed; but without frequency of pulſe, conſtituting the pareſis irritativa of Claſs I. 2. 1. 2. And laſtly, if a paucity of blood attends this pareſis, or ſome other cauſe inducing a frequency of pulſe, the febris inirritativa, or fever with weak pulſe, is produced.

But on the contrary when the ſtomach has previouſly been rendered torpid by defect of ſtimulus, as by hunger, if food be too haſtily ſupplied, not only great exertion of the ſtomach itſelf ſucceeds, but fever with ſtrong pulſe is induced in conſequence; that is, the heart and arteries are excited into more energetic action by the exceſs of the power of aſſociation, which catenates their motions with thoſe of the ſtomach. For the redundancy of ſenſorial power of irritation, which was accumulated during the inactivity of the ſtomach, and is now called into action by ſtimulus, actuates that organ with increaſed energy, and excites by theſe increaſed motions the ſenſorial power of aſſociation; which has alſo been accumulated during the inactivity of the heart and arteries; and thus theſe organs alſo are now excited into greater action.

So after the ſkin has been expoſed ſome hours to greater heat than natural in the warm room, other parts, as the membranes of the noſtrils, or of the lungs, or of the ſtomach, are liable to become torpid from direct ſympathy with it, when we come into air of a moderate temperature; whence

whence catarrhs, coughs, and fevers. But if this torpor be occaſioned by defect of ſtimulus, as after being expoſed to froſty air, the accumulation of ſenſorial power is exerted, and a glow of the ſkin follows, with increaſed digeſtion, full reſpiration, and more vigorous circulation.

11. It may be aſked, Why is there a great and conſtant accumulation of the ſenſorial power of aſſociation, owing to the torpor of the ſtomach and heart and arteries, in continued fever with weak pulſe; which is exerted on the cutaneous and pulmonary capillaries, ſo as to excite them into increaſed action for many weeks, and yet no ſuch exuberance of ſenſorial power produces fever in winter-ſleeping animals, or in chloroſis, or apepſia, or hyſteria?

In winter-ſleeping animals I ſuppoſe the whole nervous ſyſtem is torpid, or paralyſed, as in the ſleep of frozen people; and that the ſtomach is torpid in conſequence of the inactivity or quieſcence of the brain; and that all other parts of the body, and the cutaneous capillaries with the reſt, labour under a ſimilar torpor.

In chloroſis, I imagine, the actions of the heart and arteries, as well as thoſe of the cutaneous and pulmonary capillaries, ſuffer along with thoſe of the ſtomach from the deficient ſtimulus of the pale blood; and that though the liver is probably the ſeat of the original torpor in this diſeaſe, with which

which all other parts ſympathize from defect of the excitation of the ſenſorial power of aſſociation; yet as this torpor occurs in ſo ſmall a degree as not to excite a ſhuddering or cold fit, no obſervable conſequences are in general occaſioned by the conſequent accumulation of ſenſorial power. Sometimes indeed in chloroſis there does occur a frequent pulſe and hot ſkin; in which circumſtances I ſuppoſe the heart and arteries are become in ſome degree torpid by direct ſympathy with the torpid liver; and that hence not only the pulſe becomes frequent, but the capillaries of the ſkin act more violently by reverſe ſympathy with the heart and arteries, owing to the accumulation of the ſenſorial power of aſſociation in them during their torpid ſtate, as occurs in irritative fever. See Article 11 of this Supplement.

In apepſia chronica the actions of the ſtomach are not ſo far impaired or deſtroyed as totally to prevent the excitation of the ſenſorial power of aſſociation, which therefore contributes ſomething towards the actions of the heart and arteries, though leſs than natural, as a weak pulſe always I believe attends this diſeaſe.

There is a torpor of the ſtomach, and of the upper part of the alimentary canal in hyſteria, as is evident from the retrograde actions of the duodenum, ſtomach, and œſophagus, which conſtitute the globus hyſtericus, or ſenſation of a globe riſing into the throat. But as theſe retrograde actions

are lefs than thofe, which induce ficknefs or vomiting, and are not occafioned by previous exhauftion of the fenforial power of irritation, they do not fo totally prevent the excitement of the fenforial power of affociation, as to leffen the motion of the heart and arteries fo much as to induce fever; yet in this cafe, as in apepfia, and in chlorofis, the pulfations of the heart and arteries are weaker than natural, and are fometimes attended with occafionally increafed action of the capillaries; as appears from the flufhings of the face, and hot fkin, which generally form an evening febricula in difeafes attended with weak digeftion.

12. The increafed action, or orgafm, of the cutaneous, pulmonary, and cellular capillaries, with their fecerning and abforbent veffels, in thofe fevers which are attended with deficiency of vital action, exhaufts the patient both by the additional expenditure of fenforial power on thofe organs of fecretion, and by the too great abforption of the mucus and fat of the body; whence great debility and great emaciation. Hence one great indication of cure of continued fever with arterial debility is to diminifh the too great action of the capillaries; which is to be done by frequent ablutions, or bathing the whole fkin in tepid or in cold water, as recommended by Dr. Currie of Liverpool (Philof. Tranf. for 1792), for half

half an hour, twice a day, or at thoſe times when the ſkin feels dryeſt and hotteſt. Much cool air ſhould alſo be admitted, when the breath of the patient feels hot to one's hand; or when the tongue, eſpecially its middle part, is dry, and covered with a cruſt of indurated mucus; as theſe indicate the increaſed action of the pulmonary capillaries; in the ſame manner as the dry and hot ſkin indicates the orgaſm of the cutaneous capillaries; and the emaciation of the body that of the cellular ones.

For this purpoſe of abating the action of the capillaries by frequent ablution or fomentation, water of any degree of heat beneath that of the body will be of ſervice, and ought in accurate language to be called a cold bath; but the degree of coldneſs, where the patient is ſenſible, ſhould in ſome meaſure be governed by his ſenſations; as it is probable, that the degree of coldneſs, which is moſt grateful to him, will alſo be of the greateſt benefit to him. See Claſs III. 2. 1. 12. and Article 15 of this Supplement.

Another great uſe of frequent ablutions, or fomentations, or baths, in fevers, where the ſtomach is in ſome degree torpid, is to ſupply the ſyſtem with aqueous fluid by means of the cutaneous abſorbents; which is diſſipated faſter by the increaſed action of the ſecerning capillaries, than the ſtomach can furniſh, and occaſions great thirſt at the intervals of the ſickneſs.

IX. *Torpor of the Lungs.*

1. The lungs in many caſes of contagion may firſt be affected with torpor, and the ſkin become cold by ſympathy; in the ſame manner as a cold ſkin on going into the cold bath induces difficulty of breathing. Or the ſtomach may become affected with torpor by its ſympathy with the lungs, as in the experiments of Mr. Watt with hydrocarbonate gas; a few reſpirations of which induced ſickneſs, and even ſyncope. When the ſtomach or ſkin is thus affected ſecondarily by aſſociation, an accumulation of ſenſorial power occurs much ſooner, than when theſe parts become torpid in conſequence of previous exceſs of ſtimulus; and hence they ſooner recover their accuſtomed action, and the fever ceaſes. The particles of contagious matter thus received by reſpiration ſomewhat reſemble in their effects the acid gaſes from burning ſulphur, or from charcoal; which, if they do not inſtantly deſtroy, induce a fever, and the patient ſlowly recovers.

2. I was ſome years ago ſtooping down to look, which way the water oozed from a moraſs, as a labourer opened it with a ſpade, to detect the ſource of the ſpring, and inhaled a vapour, which occaſioned an inſtant ſenſe of ſuffocation. Immediately

mediately recoiling I believe I inhaled it but once; yet a few hours afterwards in the cool of the evening, when I returned home rather fatigued and hungry, a ſhivering and cold fit occurred, which was followed by a hot one; and the whole diſeaſe began and terminated in about twelve hours without return. In this caſe the power of fear, or of imagination, was not concerned; as I neither thought of the bad air of a moraſs before I perceived it; nor expected a fever-fit, till it occurred.

In this caſe the torpor commenced in the lungs, and after a few hours, by the addition of fatigue, and cold, and hunger, was propagated by direct ſympathy to the reſt of the ſyſtem. An orgaſm or increaſed action of the whole ſyſtem was then induced by the accumulation of ſenſorial power of irritation in the lungs, and of aſſociation in the other organs; and when theſe ſubſided, the diſeaſe ceaſed. It may be aſked, could a torpor of the capillaries of the air-veſſels of the lungs be ſo ſuddenly produced by great ſtimulation? — It appears probable, that it might, becauſe great exertion of irritative motions may be inſtantly produced without our perceiving them; that is, without their being attended by ſenſation, both in the lungs and ſtomach; and the organs may become torpid by the great expenditure of the ſenſorial power of irritation in an inſtant of time;

as paralyſis frequently inſtantly follows too great an exertion of voluntary power.

3. When the capillaries of the lungs act too violently, as in ſome continued fevers; which is known by the heat of the breath, and by the dryneſs of the tongue, eſpecially of the middle part of it; not only cooler air might be admitted more freely into a ſick room to counteract this orgaſm of the pulmonary capillaries; but perhaps the patient might breathe with advantage a mixture of carbonic acid gas, or of hydrogene gas, or of azote with atmoſpheric air. And on the contrary, when there exiſts an evident torpor of the pulmonary capillaries, which may be known by the correſpondent chilneſs of the ſkin; and by a tickling cough, which ſometimes attends cold paroxyſms of fever, and is then owing to the deficient abſorption of the pulmonary mucus, the ſaline parts of which ſtimulate the bronchiæ, or air-veſſels; a mixture of one part of oxygen gas with 10 or 20 parts of atmoſpheric air might probably be breathed with great advantage.

X. *Torpor of the Brain.*

As the inactivity or torpor of the abſorbent veſſels of the brain is the cauſe of hydrocephalus internus; and as the deficiency of venous abſorption

abſorption in the brain, or torpor of the extremities of its veins, is believed frequently to be the cauſe of apoplexies; ſo there is reaſon to conclude, that the torpor of the ſecerning veſſels of the brain, which are ſuppoſed to produce the ſenſorial power, may conſtitute the immediate cauſe of ſome fevers with arterial debility. And alſo that the increaſed action of theſe ſecerning veſſels may ſometimes conſtitute the immediate cauſe of fevers with arterial ſtrength.

It is nevertheleſs probable, that the torpor or orgaſm of the ſanguiferous, abſorbent, or ſecerning veſſels of the brain, may frequently exiſt as a ſecondary effect, owing to their aſſociation with other organs, as the ſtomach or lungs; and may thus be produced like the torpor of the heart and arteries in inirritative fevers, or like the orgaſm of thoſe organs in irritative fevers, or inflammatory ones.

Where there exiſts a torpor of the brain, might not very ſlight electric ſhocks paſſed frequently through it in all directions be uſed with advantage? Might not fomentations of 94 or 96 degrees of heat on the head for an hour at a time, and frequently repeated, ſtimulate the brain into action; as in the revival of winter-ſleeping animals by warmth? Ether externally might be frequently applied, and a bliſter on the ſhaved head.

Where the ſecerning veſſels of the brain act

with too great energy, as in ſome inflammatory fevers, might it not be diminiſhed by laying the patient horizontally on a mill-ſtone, and whirling him, till ſleep ſhould be produced, as the brain becomes compreſſed by the centrifugal force? See Article 15 of this Supplement.

XI. *Torpor of the Heart and Arteries.*

1. It was ſhewn in Claſs IV. 1. 1. 6. in IV. 2. 1. 2. and in Suppl. I. 6. 3. that a reverſe ſympathy generally exiſts between the lacteal and lymphatic branches of the abſorbent ſyſtem. Hence, when the motions of the abſorbents of the ſtomach are rendered torpid or retrograde in fevers with arterial debility, thoſe of the ſkin, lungs, and cellular membrane, act with increaſed energy. But the actions of the muſcular fibres of the heart and arteries are at the ſame time aſſociated with thoſe of the muſcular fibres of the ſtomach by direct ſympathy. Both theſe actions occur during the operation of powerful emetics, as ſquill, or digitalis; while the motions of the ſtomach continue torpid or retrograde, the cellular and cutaneous abſorbents act with greater energy, and the pulſations of the heart and arteries become weaker, and ſometimes ſlower.

2. The increaſed action of the ſtomach after a meal,

meal, and of the heart and arteries at the ſame time from the ſtimulus of the new ſupply of chyle, ſeems originally to have produced, and to have eſtabliſhed, this direct ſympathy between them. As the increaſed action of the abſorbents of the ſtomach after a meal has been uſually attended with diminiſhed action of the other branches of the abſorbent ſyſtem, as mentioned in Claſs IV. 1. 1. 6. and has thus eſtabliſhed a reverſe ſympathy between them.

2. Beſides the reverſe ſympathy of the abſorbent veſſels and the muſcles of the ſtomach, and of the heart and arteries, with thoſe of the ſkin, lungs, and cellular membrane; there exiſts a ſimilar reverſe ſympathy between the ſecerning veſſels or glands of the former of theſe organs with thoſe of the latter; that is the mucous glands of the heart and arteries act generally by direct ſympathy with thoſe of the ſtomach; and the mucous glands of the cellular membrane of the lungs, and of the ſkin, act by reverſe ſympathy with them both.

Hence when the ſtomach is torpid, as in ſickneſs, this torpor ſometimes only affects the abſorbent veſſels of it; and then the abſorbents of the cellular membrane and the ſkin only act with increaſed energy by reverſe ſympathy. If the torpor affects the muſcular fibres of the ſtomach, thoſe of the heart and arteries act by direct ſympathy

pathy with it, and a weak pulſe is produced, as in the exhibition of digitalis, but without increaſe of heat. But if the torpor alſo affects the glands of the ſtomach, the cutaneous and pulmonary glands act with greater energy by their reverſe ſympathy with thoſe of the ſtomach, and of the heart and arteries; and great heat is produced along with increaſed perſpiration both from the ſkin and lungs.

3. There is ſome difficulty in explaining, why the actions of the extenſive ſyſtem of capillary glands, which exiſt on every other membrane and cell in the body for the purpoſe of ſecreting mucus and perſpirable matter, ſhould ſo generally act by reverſe ſympathy with thoſe of the ſtomach and upper part of the inteſtines. It was ſhewn in Claſs IV. 1. 1. 6. that when the ſtomach was filled with ſolid and fluid aliment, the abſorbents of the cellular membrane, and of the bladder, and of the ſkin, acted with leſs energy; as the fluids, they were uſed to abſorb and tranſmit into the circulation, were now leſs wanted; and that hence by habit a reverſe ſympathy obtained between theſe branches of the abſorbents of the alimentary canal, and thoſe of the other parts of the body.

Now, as at this time leſs fluid was abſorbed by the cutaneous and cellular lymphatics, it would happen, that leſs would be ſecreted by their correſpondent

respondent secerning vessels, or capillary glands; and that hence by habit, these secerning vessels would acquire a reverse sympathy of action with the secerning vessels of the alimentary canal.

Thus when the absorption of the tears by the puncta lacrymalia is much increased by the stimulus of snuff; or of an affecting idea, on the nasal ducts, as explained in Sect. XVI. 8. 2. a great increase of the secretion of tears from the lacrymal glands is produced by the direct sympathy of the action of these glands with those of their correspondent absorbents; and that though in this case they are placed at so great a distance from each other.

4. A difficult question here occurs; why does it happen, that in fevers with weak pulse the contractions of the heart and arteries become at the same time more frequent; which also sometimes occurs in chlorosis, and in some hysteric and hypochondriac diseases, and in some insanities; yet at other times the weak pulse becomes at the same time slow, as in the exhibition of digitalis, and in paresis irritativa, described in Class I. 2. 1. 2. which may be termed a fever with slow pulse? this frequency of pulse can not depend on heat, because it sometimes exists without heat, as towards the end of some fevers with debility.

Now as apoplexies, which are sometimes ascribed to fulness of blood, are attended with

slow

ſlow pulſe; and as in animals dying in the ſlaughter-houſe from deficiency of blood the pulſe becomes frequent in extreme; may not the frequency of pulſe in fevers with arterial debility be in general owing to paucity of blood? as explained in Sect. XXXII. 2. 3. and its ſlowneſs in pareſis irritativa be cauſed by the debility being accompanied with due quantity of blood? or may not the former circumſtance ſometimes depend on a concomitant affection of the brain approaching to ſleep? or to the unuſual facility of the paſſage of the blood through the pulmonary and aortal capillaries? in which circumſtance the heart may completely empty itſelf at each pulſation, though its contractions may be weak. While the latter depends on the difficulty of the paſſage of the blood through the pulmonary or aortal capillaries, as in the cold fits of intermittents, and in ſome palpitations of the heart, and in ſome kinds of hæmoptoe; in theſe caſes the increaſed reſiſtance prevents the heart from emptying itſelf, and in conſequence a new diaſtole ſooner occurs, and thus the number of pulſations becomes greater in a given time.

5. In reſpect to the ſympathies of action, which produce or conſtitute fever with debility, the ſyſtem may be divided into certain provinces, which are aſſentient or oppoſite to each other. Firſt, the lacteals or abſorbent veſſels of the

ſtomach, and upper part of the inteſtines; ſecondly, the lymphaties or all the other branches of the abſorbent veſſels, which ariſe from the ſkin, mucous membranes, cellular membranes, and the various glands. Theſe two diviſions act by reverſe ſympathy with each other in the hot fits of fever with debility, though by direct ſympathy in the cold ones. The third diviſion conſiſts of the ſecerning veſſels of the ſtomach and upper inteſtines; and the fourth of the ſecerning veſſels of all the other parts of the body, as the capillary glands of the ſkin, lungs, and cellular membrane, and the various other glands belonging to the ſanguiferous ſyſtem. Many of theſe frequently, but the capillaries always, act by reverſe ſympathy with thoſe of the third diviſion above mentioned in the hot fits of fever with debility, though by direct ſympathy with them in the cold fits. Fifthly, the muſcular fibres of the ſtomach, and upper inteſtines; and ſixthly, the muſcular fibres of the heart and arteries. The actions of theſe two laſt diviſions of moving fibres act by direct ſympathy with each other, both in the cold and hot fits of fevers with debility.

The efficient cauſe of thoſe apparent ſympathies in fevers with weak pulſe may be thus underſtood. In the cold paroxyſm of fever with weak pulſe the part firſt affected I believe to be the ſtomach, and that it has become torpid by previous violent exertion, as by ſwallowing contagious

tagious matter mixed with ſaliva, and not by defect of ſtimulus, as from cold or hunger. The actions of this important organ, which ſympathizes with almoſt every part of the body, being thus much diminiſhed or nearly deſtroyed, the ſenſorial power of aſſociation is not excited; which in health contributes to move the heart and arteries, and all the reſt of the ſyſtem; whence an univerſal torpor occurs.

When the hot fit approaches, the ſtomach in fevers with ſtrong pulſe regains its activity by the accumulation of the ſenſorial power either of irritation, if it was the part firſt affected, or of aſſociation if it was affected in ſympathy with ſome other torpid part, as the ſpleen or liver; which accumulation is produced during its torpor. At the ſame time all the other parts of the ſyſtem acquire greater energy of action by the accumulation of the ſenſorial power of aſſociation, which was produced, during their inactivity in the cold fit.

But in fevers with weak pulſe the ſtomach, in which the ſenſorial power of irritation had been previouſly exhauſted by violent action, acquires no ſuch quick accumulation of ſenſorial power, but remains in a ſtate of torpor after the hot fit commences. The heart and arteries remain alſo in a ſtate of torpor, becauſe there continues to be no excitement of their power of aſſociation owing to the torpid motions of the ſtomach; but hence

it

it happens, that there exists at this time a great accumulation of the power of association in the less active fibres of the heart and arteries; which, as it is not excited and expended by them, increases the associability of the next link of the associated chain of motions, which consists of the capillaries or other glands; and that in so great a degree as to actuate them with unnatural energy, and thus to produce a perpetual hot fit of fever. Because the associability of the capillaries is so much increased by the accumulation of this power, owing to the lessened activity of the heart and arteries, as to over-balance the lessened excitement of it by the weaker movements of the heart and arteries.

6. When the accumulation of the sensorial power of irritation caused by defect of stimulus is greater in the first link of a train of actions, to which associated motions are catenated, than the deficiency of the excitement of the sensorial power of association, in the next link, what happens? — the superabundance of the unemployed sensorial power of the first link is derived to the second; the associability of which thus becomes so greatly increased, that it acts more violently than natural, though the excitement of its power of association by the lessened action of the first link is less than natural. So that in this situation the withdrawing of an accustomed stimulus in some

parts

parts of the ſyſtem will decreaſe the irritative motions of that part, and at the ſame time occaſion an increaſe of the aſſociate motion of another part, which is catenated with it.

This circumſtance nevertheleſs can only occur in thoſe parts of the ſyſtem, whoſe natural actions are perpetual, and the accumulation of ſenſorial power on that account very great, when their activity is much leſſened by the deduction of their uſual ſtimulus; and are therefore only to be found in the ſanguiferous ſyſtem, or in the alimentary canal, or in the glands and capillaries. Of the firſt of which the following is an inſtance.

The reſpiration of a reduced atmoſphere, that is of air mixed with hydrogene or azote, quickens the pulſe, as obſerved in the caſe of Mrs. Eaton by Dr. Reynolds and Dr. Thornton; to which Dr. Beddoes adds in a note, that "he never ſaw an inſtance in which a lowered atmoſphere did not at the moment quicken the pulſe, while it weakened the action of the heart and arteries." Conſiderations on Factitious Airs, by Thomas Beddoes and James Watt, Part III. p. 67. Johnſon, London. By the aſſiſtance of this new fact the curious circumſtance of the quick production of warmth of the ſkin on covering the head under the bed-clothes, which every one muſt at ſome time have experienced, receives a more ſatisfactory explanation, than that which is given in Claſs IV. 1. 1. 2. which was printed before this part

part of Dr. Beddoes's Considerations was published.

For if the blood be deprived of its accustomed quantity of oxygen, as in covering the head in bed, and thus breathing an air rendered impure by repeated respiration, or by breathing a factitious air with less proportion of oxygen, which in common respiration passes through the moist membranes of the lungs, and mixes with the blood, the pulsations of the heart and arteries become weaker, and consequently quicker, by the defect of the stimulus of oxygen. And as these vessels are subject to perpetual motion, the accumulation of the sensorial power of irritation becomes so great by their lessened activity, that it excites the vessels next connected, the cutaneous capillaries for instance, into more energetic actions, so as to produce increased heat of the skin, and greater perspiration.

How exactly this resembles a continued fever with weak and quick pulse!—in the latter the action of the heart and arteries are lessened by defect of the excitement of the sensorial power of association, owing to the torpor or lessened actions of the stomach; hence the accumulation of the sensorial power of association in this case, as the accumulation of that of irritation in the former, becomes so abundant as to excite into increased action the parts most nearly connected, as the cutaneous capillaries.

In reſpect to the circumſtance mentioned by Sydenham, that covering the head in bed in a ſhort time relieved the pertinacious ſickneſs of the patient, it muſt be obſerved, that when the action of the heart and arteries becomes weakened by the want of the due ſtimulus of the proper quantity of oxygen in the blood, an accumulation of the ſenſorial power of irritation occurs in the fibres of the heart and arteries, which then is expended on thoſe of the capillary glands, increaſing their actions and conſequent ſecretions and heat. And then the ſtomach is thrown into ſtronger action, both by the greater excitement of its natural quantity of the ſenſorial power of aſſociation by the increaſed actions of the capillaries, and alſo by ſome increaſe of aſſociability, as it had been previouſly a long time in a ſtate of torpor, or leſs activity than natural, as evinced by its perpetual ſickneſs.

In a manner ſomewhat ſimilar to this, is the redneſs of the ſkin produced in angry people by the ſuperabundance of the unemployed ſenſorial power of volition, as explained in Claſs IV. 2. 3. 5. Rubor ex irâ. From hence we learn how, when people in fevers with weak pulſe, or in dropſies, become inſane, the abundance of the unemployed ſenſorial power of volition increaſes the actions of the whole moving ſyſtem, and cures thoſe diſeaſes.

7. As

7. As the orgaſm of the capillaries in fevers with weak pulſe is immediately cauſed by the torpid actions of the heart and arteries, as above explained, this ſupplies us with another indication of cure in ſuch fevers, and that is to ſtimulate theſe organs. This may probably be done by ſome kind of medicines, which are known to paſs into the blood unchanged in ſome of their properties. It is poſſible that nitre, or its acid, may paſs into the blood and increaſe the colour of it, and thus increaſe its ſtimulus, and the ſame may be ſuppoſed of other ſalts, neutral or metallic? As rubia tinctoria, madder, colours the bones of young animals, it muſt paſs into the blood with its colouring matter at leaſt unchanged, and perhaps many other medicines may likewiſe affect the blood, and thus act by ſtimulating the heart and arteries, as well as by ſtimulating the ſtomach; which circumſtance deſerves further attention.

Another way of immediately ſtimulating the heart and arteries would be by transfuſing new blood into them. Is it poſſible that any other fluid beſides blood, as chyle, or milk, or water, could, if managed with great art, be introduced ſafely or advantageouſly into the vein of a living animal?

A third method of exciting the heart and arteries immediately is by increaſing the natural ſtimulus of the blood, and is well worthy experiment in all fevers with weak pulſe; and that

consists in supplying the blood with a greater proportion of oxygen; which may be done by respiration, if the patient was to breathe either oxygen gas pure, or diluted with atmospheric air, which might be given to many gallons frequently in a day, and by passing through the moist membranes of the lungs, according to the experiments of Dr. Priestley, and uniting with the blood, might render it more stimulant, and thus excite the heart and arteries into greater action! May not some easier method of exhibiting oxygen gas by respiration be discovered, as by using very small quantities of hyper-oxygenated marine acid gas very much diluted with atmospheric air?

XII. *Torpor of the Stomach and upper Intestines.*

1. The principal circumstance, which supports the increased action of the capillaries in continued fever with weak pulse, is their reverse sympathy with those of the stomach and upper intestines, or with those of the heart and arteries. The torpor of the stomach and upper intestines is apparent in continued fevers from the total want of appetite for solid food, beside the sickness with which fevers generally commence, and the frequent diarrhœa with indigested stools, at the same time the thirst of the patient is sometimes

times urgent at the intervals of the ſickneſs. Why the ſtomach can at this time take fluids by intervals, and not ſolids, is difficult to explain; except it be ſuppoſed, as ſome have affirmed, that the lacteal abſorbents are a different branch from the lymphatic abſorbents, and that in this caſe the former only are in a ſtate of permanent torpor.

2. The torpor of the heart and arteries is known by the weakneſs of the pulſe. When the actions of the abſorbents of the ſtomach are diminiſhed by the exhibition of ſmall doſes of digitalis, or become retrograde by larger ones, the heart and arteries act more feebly by direct ſympathy; but the cellular, cutaneous, and pulmonary abſorbents are excited into greater action. Whence in anaſarca the fluids in the cellular membrane throughout the whole body are abſorbed during the ſickneſs, and frequently a great quantity of atmoſpheric moiſture at the ſame time; as appears by the very great diſcharge of urine, which ſometimes happens in theſe caſes; and in ileus the prodigious evacuations by vomiting, which are often a hundred fold greater than the quantity ſwallowed, evince the great action of all the other abſorbents during the ſickneſs of the ſtomach.

3. But when the ſtomach is rendered perma-

nently ſick by an emetic drug, as by digitalis, it is not probable, that much accumulation of ſenſorial power is ſoon produced in this organ; becauſe its uſual quantity of ſenſorial power is previouſly exhauſted by the great ſtimulus of the foxglove; and hence it ſeems probable, that the great accumulation of ſenſorial power, which now cauſes the increaſed action of the abſorbents, is produced in conſequence of the inactivity of the heart and arteries; which inactivity is induced by deficient excitement of the ſenſorial power of aſſociation between thoſe organs and the ſtomach, and not by any previous exhauſtion of their natural quantity of ſenſorial power; whereas in ileus, where the torpor of the ſtomach, and conſequent ſickneſs, is induced by reverſe ſympathy with an inflamed inteſtine, that is, by diſſevered or defective aſſociation; the accumulation of ſenſorial power, which in that diſeaſe ſo violently actuates the cellular, pulmonary, and cutaneous abſorbents, is apparently produced by the torpor of the ſtomach and lacteals, and the conſequent accumulation of the ſenſorial power of aſſociation in them owing to their leſſened action in ſickneſs.

4. This accounts for the dry ſkin in fevers with weak pulſe, where the ſtomach and the heart and arteries are in a torpid ſtate, and for the ſudden emaciation of the body; becauſe the actions

actions of the cellular and cutaneous abſorbents are increaſed by reverſe ſympathy with thoſe of the ſtomach, or with thoſe of the heart and arteries; that is by the expenditure of that ſenſorial power of aſſociation, which is accumulated in conſequence of the torpor of the ſtomach and heart and arteries, or of either of them; this alſo explains the ſudden abſorption of the milk in puerperal fevers; and contributes along with the heat of the reſpired air to the dryneſs of the mucous membrane of the tongue and noſtrils.

5. Beſides the reverſe ſympathy, with which the abſorbent veſſels of the ſtomach and upper inteſtines act in reſpect to all the other abſorbent veſſels, as in the exhibition of digitalis, and in ileus; there is another reverſe ſympathy exiſts between the capillaries, or ſecretory veſſels of the ſtomach, and thoſe of the ſkin. Which may nevertheleſs be occaſioned by the accumulation of ſenſorial power by the torpor of the heart and arteries, which is induced by direct ſympathy with the ſtomach; thus when the torpor of the ſtomach remains in a fever-fit, which might otherwiſe have intermitted, the torpor of the heart and arteries remains alſo by direct ſympathy, and the increaſed cutaneous capillary action, and conſequent heat, are produced by reverſe ſympathy; and the fever is thus rendered continual, owing primarily to the torpor of the ſtomach.

6. The reverſe ſympathy, which exiſts between the capillaries of the ſtomach and the cutaneous capillaries, appears by the chillneſs of ſome people after dinner; and contrariwiſe by the digeſtion being ſtrengthened, when the ſkin is expoſed to cold air for a ſhort time; as mentioned in Claſs IV. 1. 1. 4. and IV. 2. 1. 1. and from the heat and glow on the ſkin, which attends the action of vomiting; for though when ſickneſs firſt commences, the ſkin is pale and cold; as it then partakes of the general torpor, which induces the ſickneſs; yet after the vomiting has continued ſome minutes, ſo that an accumulation of ſenſorial power exiſts in the capillaries of the ſtomach, and of the ſkin, owing to their diminiſhed action; a glow of the ſkin ſucceeds, with ſweat, as well as with increaſed abſorption.

7. Nevertheleſs in ſome circumſtances the ſtomach and the heart and arteries ſeem to act by direct ſympathy with the cutaneous capillaries, as in the fluſhing of the face and glow of the ſkin of ſome people after dinner; and as in fevers with ſtrong pulſe. In theſe caſes there appears to be an increaſed production of ſenſorial power, either of ſenſation, as in the bluſh of ſhame; or of volition, as in the bluſh of anger; or of irritation, as in the fluſhed face after dinner above mentioned.

This

This increaſed action of the capillaries of the ſkin along with the increaſed actions of the ſtomach and heart is perhaps to be eſteemed a ſynchronous increaſe of action, rather than a ſympathy between thoſe organs. Thus the fluſhing of the face after dinner may be owing to the ſecretion of ſenſorial power in the brain being increaſed by the aſſociation of that organ with the ſtomach, in a greater proportion than the increaſed expenditure of it, or may be owing alſo to the ſtimulus of new chyle received into the blood.

8. When the ſtomach and the heart and arteries are rendered torpid in fevers, not only the cutaneous, cellular, and pulmonary abſorbents are excited to act with greater energy; but alſo their correſpondent capillaries and ſecerning veſſels or glands, eſpecially perhaps thoſe of the ſkin, are induced into more energetic action. Whence greater heat, a greater ſecretion of perſpirable matter, and of mucus; and a greater abſorption of them both, and of aerial moiſture. Theſe reverſe ſympathies coincide with other animal facts, as in eruption of ſmall-pox on the face and neck the feet become cold, while the face and neck are much fluſhed; and in the hemiplegia, when one arm and leg become diſobedient to volition, the patient is perpetually moving the other. Which are well accounted for by the accumulation of ſenſorial

rial power in one part of an aſſociated ſeries of actions, when leſs of it is expended by another part of it; and by a deficiency of ſenſorial power in the ſecond link of aſſociation, when too much of it is expended by the firſt.

9. This doctrine of reverſe ſympathy enables us to account for that difficult problem, why in continued fevers the increaſed action of the cutaneous, cellular, and pulmonary capillaries proceeds without interruption or return of cold fit; though perhaps with ſome exacerbations and remiſſions; and that during a quarter, or half, or three quarters, or a whole lunation; while at the ſame time the pulſations of the heart and arteries are weaker than natural.

To this ſhould be added the direct ſympathy, which exiſts between the periſtaltic motions of the fibres of the ſtomach, and the pulſations of the heart. And that the ſtomach has become torpid by the too great ſtimulus of ſome poiſonous or contagious matter; and this very intricate idea of continued fever with feeble pulſe is reduced to curious ſimplicity.

The direct ſympathy of the ſtomach and heart and arteries not only appears from the ſtronger and ſlower pulſe of perſons exhauſted by fatigue, after they have drunk a glaſs of wine, and eaten a few mouthfuls; but appears alſo from the exhibition of large doſes of digitalis; when the pa-

tient labours under great and inceſſant efforts to vomit, at the ſame time that the actions of the abſorbent ſyſtem are known to be much increaſed by the haſty abſorption of the ſerous fluid in anaſarca, the pulſations of the heart become ſlow and intermittent to an alarming degree, See Claſs IV. 2. 1. 17. and 18.

10. It would aſſiſt us much in the knowledge and cure of fevers, if we could always determine, which part of the ſyſtem was primarily affected; and whether the torpor of it was from previous exceſs or defect of ſtimulus; which the induſtry of future obſervers muſt diſcover. Thus if the ſtomach be affected primarily, and that by previous exceſs of ſtimulus, as when certain quantities of opium, or wine, or blue vitriol, or arſenic, are ſwallowed, it is ſome time in recovering the quantity of ſenſorial power previouſly exhauſted by exceſs of ſtimulus, before any accumulation of it can occur. But if it be affected with torpor ſecondarily, by ſympathy with ſome diſtant part; as with the torpid capillaries of the ſkin, that is by defective excitement of the ſenſorial power of aſſociation; or if it be affected by defect of ſtimulus of food or of heat; it ſooner acquires ſo much accumulation of ſenſorial power, as to be enabled to accommodate itſelf to its leſſened ſtimulus by increaſe of its irritability.

Thus in the hemicrania the torpor generally commences

commences in a diſeaſed tooth, and the membranes about the temple, and alſo thoſe of the ſtomach become torpid by direct ſynchronous ſympathy; and pain of the head, and ſickneſs ſupervene; but no fever or quickneſs of pulſe. In this caſe the torpor of the ſtomach is owing to defect of the ſenſorial power of aſſociation, which is cauſed by the too feeble actions of the membranes ſurrounding the diſeaſed tooth, and thus the train of ſympathy ceaſes here without affecting the motions of the heart and arteries; but where contagious matter is ſwallowed into the ſtomach, the ſtomach after a time becomes torpid from exhauſtion of the ſenſorial power of irritation, and the heart and arteries act feebly from defect of the excitement of the power of aſſociation. In the former caſe the torpor of the ſtomach is conquered by accumulation of the power of aſſociation in one or two whole days; in the latter it recovers by accumulation of the power of irritation in three or four weeks.

In intermittent fevers the ſtomach is generally I believe affected ſecondarily by ſympathy with the torpid cutaneous capillaries, or with ſome internal torpid viſcus, and on this account an accumulation of ſenſorial power ariſes in a few hours ſufficient to reſtore the natural irritability of this organ; and hence the hot fit ſucceeds, and the fever intermits. Or if this accumulation

of

of ſenſorial power becomes exceſſive and permanent, the continued fever with ſtrong pulſe is produced, or febris irritativa.

In continued fevers the ſtomach is frequently I ſuppoſe affected with torpor by previous exceſs of ſtimulus, and conſequent exhauſtion of ſenſorial power, as when contagious matter is ſwallowed with the ſaliva, and it is then much ſlower in producing an accumulation of ſenſorial power ſufficient to reſtore its healthy irritability; which is a frequent cauſe of continued fever with weak pulſe or febris inirritativa. Which conſiſts, after the cold fit is over, in a more frequent and more feeble action of the heart and arteries, owing to their direct ſympathy with the muſcular fibres of the torpid ſtomach; together with an increaſed action of the capillaries, glands, and abſorbents of the ſkin, and cellular membrane, owing to their reverſe ſympathy with the torpid capillaries, glands, and abſorbents of the ſtomach, or with thoſe of the heart and arteries.

Or in more accurate language. 1. The febris inirritativa, or fever with weak pulſe, commences with torpor of the ſtomach, occaſioned by previous exhauſtion of ſenſorial power of irritation by the ſtimulus of contagious matter ſwallowed with the ſaliva. 2. The whole ſyſtem becomes torpid from defect of the excitement of the ſenſorial power of aſſociation owing to the too feeble actions of the ſtomach, this is the cold fit. 3.

The

The whole ſyſtem, except the ſtomach with the upper inteſtines, and the heart and arteries, falls into increaſed action, or orgaſm, owing to accumulation of ſenſorial power of aſſociation during their previous torpor, this is the hot fit. 4. The ſtomach and upper inteſtines have not acquired their natural quantity of ſenſorial power of irritation, which was previouſly exhauſted by violent action in conſequence of the ſtimulus of contagious matter, and the heart and arteries remain torpid from deficient excitement of the ſenſorial power of aſſociation, owing to the too feeble actions of the ſtomach. 5. The accumulation of ſenſorial power of aſſociation in conſequence of the torpor of the heart and arteries occaſions a perpetual orgaſm, or increaſed action of the capillaries.

11. From hence it may be deducted firſt, that when the torpor of the ſtomach firſt occurs, either as a primary effect, or as a ſecondary link of ſome aſſociate train or circle of motions, a general torpor of the ſyſtem ſometimes accompanies it, which conſtitutes the cold fit of fever; at other times no ſuch general torpor occurs, as during the operation of a weak emetic, or during ſea-ſickneſs.

Secondly. After a time it generally happens, that a torpor of the ſtomach ceaſes, and its actions are renewed with increaſe of vigour by accumulation

cumulation of ſenſorial power during its quieſcence; as after the operation of a weak emetic, or at the intervals of ſea-ſickneſs, or after the paroxyſm of an intermittent fever.

Thirdly. The ſtomach is ſometimes much ſlower in recovering from a previous torpor, and is then the remote cauſe of continued fever with weak pulſe; which is owing to a torpor of the heart and arteries, produced in conſequence of the deficient excitement of the power of aſſociation by the too weak actions of the ſtomach; and to an orgaſm of the capillaries of the other parts of the ſyſtem, in conſequence of the accumulation of ſenſorial power occaſioned by the inactivity of the heart and arteries.

Fourthly. The torpor of the ſtomach is ſometimes ſo complete, that probably the origin of its nerves is likewiſe affected, and then no accumulation of ſenſorial power occurs. In this caſe the patient dies for want of nouriſhment; either in three or four weeks, of the inirritative fever; or without quick pulſe, by what we have called pareſis irritativa. Or he continues many years in a ſtate of total debility. When this torpor ſuddenly commences, the patient generally ſuffers epileptic fits or temporary inſanity from the diſagreeable ſenſation of ſo great a torpor of the ſtomach; which alſo happens ſometimes at the eruption of the diſtinct ſmall-pox; whence we have termed this diſeaſe anorexia epileptica.

See

See Clafs II. 2. 2. 1. and III. 1. 1. 7. and Suppl. I. 14. 3.

Fifthly. When this torpor of the ftomach is lefs in degree or extent, and yet without recovering its natural irritability by accumulation of fenforial power, as it does after the cold fit of intermittent fever, or after the operation of mild emeties, or during fyncope; a permanent defect of its activity, and of that of the upper inteftines, remains, which conftitutes apepfia, cardialgia, hypochondriafis, and hyfteria. See Clafs I. 3. 1. 3. and I. 2. 4. 5.

Sixthly. If the torpor of the ftomach be induced by direct fympathy, as in confequence of a previous torpor of the liver, or fpleen, or fkin, an accumulation of fenforial power will fooner be produced in the ftomach; becaufe there has been no previous expenditure of it, the prefent torpor of the ftomach arifing from defect of affociation. Hence fome fevers perfectly intermit, the ftomach recovering its complete action after the torpor and confequent orgafm, which conftitute the paroxyfm of fever, are terminated.

Seventhly. If the torpor of the ftomach be owing to defect of irritation, as to the want of food, an accumulation of fenforial power foon occurs with an increafe of digeftion, if food be timely applied; or with violent inflammation, if food be given in too great quantity after very long abftinence.

Eighthly.

Eighthly. If the torpor of the ſtomach be induced by defect of pleaſurable ſenſation, as when ſickneſs is cauſed by the ſuggeſtion of nauſeous ideas; an accumulation of ſenſorial power ſoon occurs, and the ſickneſs ceaſes with the return of hunger; for in this caſe the inactivity of the ſtomach is occaſioned by the ſubduction of agreeable ſenſation, which acts as a ſubduction of ſtimulus, and not by exhauſting the natural quantity of ſenſorial power in the fibres or nerves of the ſtomach.

Ninthly. If the torpor of the ſtomach be induced by a twofold cauſe, as in ſea-ſickneſs. See Vertigo rotatoria. Claſs IV. 2. 1. 10. in which the firſt link of aſſociation acts too ſtrongly, and in conſequence expends more than uſual of the ſenſorial power of irritation; and ſecondly in which ſenſation is produced between the links of aſſociation, and diſſevers or enfeebles them; the accumulation of ſenſorial power ſoon occurs in the ſtomach; as no previous expenditure of it in that organ has occurred. Whence in ſea-ſickneſs the perſons take food with eagerneſs at times, when the vertigo ceaſes for a few minutes.

Tenthly. If the gaſtric torpor be induced by previous violent exertion, as after intoxication, or after contagious matter has been ſwallowed, or ſome poiſons, as digitalis, or arſenic; an accumulation of ſenſorial power very ſlowly ſucceeds; whence long ſickneſs, or continued fever, be-

cauſe the quantity of ſenſorial power already waſted muſt firſt be renewed, before an accumulation of it can be produced.

12. This leads us to a ſecond indication of cure in continued fevers, which conſiſts in ſtrengthening the actions of the ſtomach; as the firſt indication conſiſted in decreaſing the actions of the cutaneous capillaries and abſorbents. The actions of the ſtomach may ſometimes be increaſed by exhibiting a mild emetic; as an accumulation of ſenſorial power in the fibres of the ſtomach is produced during their retrograde actions. Beſides the evacuation of any noxious material from the ſtomach, and duodenum, and from the abſorbents, which open their mouths on their internal ſurfaces, by their retrograde motion.

It is probable, that when mild emetics are given, as ipecacuanha, or antimonium tartarizatum, or infuſion of chamomile, they are rejected by an inverted motion of the ſtomach and œſophagus in conſequence of diſagreeable ſenſation, as duſt is excluded from the eye; and theſe actions having by previous habit been found effectual, and that hence there is no exhauſtion of the ſenſorial power of irritation. But where ſtrong emetics are adminiſtered, as digitalis, or contagious matter, the previous exhauſtion of the ſenſorial power of irritation ſeems to be a cauſe of

of the continued retrograde actions and ſickneſs of the ſtomach. An emetic of the former kind may therefore ſtrengthen the power of the ſtomach immediately after its operation by the accumulation of ſenſorial power of irritation during its action. See Claſs IV. 1. 1.

Another method of decreaſing the action of the ſtomach for a time, and thence of increaſing it afterwards, is by the accumulation of the ſenſorial power of irritation during its torpor; is by giving ice, iced water, iced creams, or iced wine. This accounts for the pleaſure, which many people in fevers with weak pulſe expreſs on drinking cold beverage of any kind.

A ſecond method of exciting the ſtomach into action, and of decreaſing that of the capillaries in conſequence, is by the ſtimulus of wine, opium, bark, metallic ſalts of antimony, ſteel, copper, arſenic, given in ſmall repeated quantities; which ſo long as they render the pulſe ſlower are certainly of ſervice, and may be given warm or cold, as moſt agreeable to the patient. For it is poſſible, that the capillaries of the ſtomach may act too violently, and produce heat, at the ſame time that the large muſcles of it may be in a torpid ſtate; which curious circumſtance future obſervations muſt determine.

Thirdly. Hot fomentation on the region of the ſtomach might be of moſt eſſential ſervice by its ſtimulus, as heat penetrates the ſyſtem not

by the abſorbent veſſels, but by external influence; whence the uſe of hot fomentation to the head in torpor of the brain; and the uſe of hot bath in caſes of general debility, which has been much too frequently neglected from a popular error occaſioned by the unmeaning application of the word relaxation to animal power. If the fluid of heat could be directed to paſs through particular parts of the body with as little diffuſion of its influence, as that of electricity in the ſhocks from the coated jar, it might be employed with ſtill greater advantage.

Fourthly. The uſe of repeated ſmall electric ſhocks through the region of the ſtomach might be of ſervice in fevers with weak pulſe, and well deſerves a trial; twenty or thirty ſmall ſhocks twice a day for a week or two would be a promiſing experiment.

Fifthly. A bliſter on the back, or ſides, or on the pit of the ſtomach, repeated in ſucceſſion, by ſtimulating the ſkin frequently ſtrengthens the action of the ſtomach by exciting the ſenſorial power of aſſociation; this eſpecially in thoſe fevers where the ſkin of the extremities, as of the hands or noſe or ears, ſooner becomes cold, when expoſed to the air, than uſual.

Sixthly. The action of the ſtomach may be increaſed by preventing too great expenditure of ſenſorial power in the link of previous motion with which it is catenated, eſpecially if the action

tion of that link be greater than natural. Thus as the capillaries of the ſkin act too violently in fevers with weak pulſe, if theſe are expoſed to cold air or cold water, the ſenſorial power, which previouſly occaſioned their orgaſm, becomes accumulated, and tends to increaſe the action of the ſtomach; thus in thoſe fevers with weak pulſe and hot ſkin, if the ſtomach be ſtimulated by repeated ſmall doſes of bark and wine or opium, and be further excited at the ſame time by accumulation of ſenſorial power occaſioned by rendering the capillaries torpid by cold air or water, this twofold application is frequently attended with viſible good effect.

By thus ſtimulating the torpid ſtomach into greater action, the motions of the heart and arteries will likewiſe be increaſed by the greater excitement of the power of aſſociation. And the capillaries of the ſkin will ceaſe to act ſo violently, from their not poſſeſſing ſo great a ſuperfluity of ſenſorial power as during the greater quieſcence of the ſtomach and of the heart and arteries. Which is in ſome circumſtances ſimilar to the curious phenomenon mentioned in Claſs IV, 2. 2. 10; where, by covering the chill feet with flannel at the eruption of the ſmall-pox, the points of the flannel ſtimulate the ſkin of the feet into greater action, and the quantity of heat, which they poſſeſs, is alſo confined, or inſulated, and further increaſes by its ſtimulus the activity of the

cutaneous veſſels of the feet; and by that circumſtance abates the too great action of the capillaries of the face, and the conſequent heat of it.

XIII. *Caſe of continued Fever.*

The following caſe of continued fever which I frequently ſaw during its progreſs, as it is leſs complicate than uſual, may illuſtrate this doctrine. Maſter S. D. an active boy about eight years of age, had been much in the ſnow for many days, and ſat in the claſſical ſchool with wet feet; he had alſo about a fortnight attended a writing ſchool, where many children of the lower order were inſtructed. He was ſeized on February the 8th, 1795, with great languor, and pain in his forehead, with vomiting and perpetual ſickneſs; his pulſe weak, but not very frequent. He took an emetic, and on the next day had a bliſter, which checked the ſickneſs only for a few hours; his ſkin became perpetually hot, and dry; and his tongue white and furred; his pulſe when aſleep about 104 in a minute, and when awake about 112.

Fourth day of the diſeaſe. He has had another bliſter, the pain of his head is gone, but the ſickneſs continues by intervals; he refuſes to take any ſolid food, and will drink nothing but milk, or milk and water, cold. He has two or three very liquid ſtools every day, which are

ſometimes green, but generally of a darkiſh yellow, with great flatulency both upwards and downwards at thoſe times. An antimonial powder was once given, but inſtantly rejected; a ſpoonful of decoction of bark was alſo exhibited with the ſame event. His legs are bathed, and his hands and face are moiſtened twice a day for half an hour in warmiſh water, which is nevertheleſs much colder than his ſkin.

Eighth day. His ſkin continues hot and dry without any obſervable remiſſions, with liquid ſtools and much flatulency and ſickneſs; his water when obſerved was of a ſtraw colour. He has aſked for cider, and drinks nearly a bottle a day mixed with cold water, and takes three drops of laudanum twice a day.

Twelfth day. He continues much the ſame, takes no milk, drinks only cider and water, ſkin hot and dry, tongue hot and furred, with liquid ſtools, and ſickneſs always at the ſame time; ſleeps much.

Sixteenth day. Was apparently more torpid, and once rather delirious; pulſe 112. Takes only capillaire and water; ſleeps much.

Twentieth day. Pulſe 100, ſkin dry but leſs hot, liquid ſtools not ſo frequent, he is emaciated to a great degree, he has eaten half a tea-cup full of cuſtard to day, drinks only capillaire and water, has thrice taken two large ſpoonfuls of decoction of bark with three drops of laudanum,

refuſes to have his legs bathed, and will now take nothing but three drops of laudanum twice a day.

Twenty-fourth day. He has gradually taken more cuſtard every day, and began to attend to ſome new playthings, and takes wine ſyllabub.

Twenty-eighth day. He daily grows ſtronger, eats eggs, and bread and butter, and ſleeps immediately after his food, can creep on his hands and knees, but cannot ſtand erect.

Thirty-ſecond day. He cannot yet ſtand alone ſafely, but ſeems hourly to improve in ſtrength of body, and activity of mind.

In this caſe the remote cauſe of his fever could not be well aſcertained, as it might be from having his feet cold for many ſucceſſive days, or from contagion; but the latter ſeems more probable, becauſe his younger brother became ill of a ſimilar fever about three weeks afterwards, and probably received the infection from him. The diſeaſe commenced with great torpor of the ſtomach, which was ſhewn by his total averſion to ſolid food, and perpetual ſickneſs; the watery ſtools, which were ſometimes green, or of a darkiſh yellow, were owing to the acrimony, or acidity, of the contents of the bowels; which as well as the flatulency were occaſioned by indigeſtion. This torpor of the ſtomach continued throughout the whole fever, and when it ceaſed, the fever ceaſed along with it.

The

The contagious material of this fever I ſuppoſe to have been mixed with the ſaliva, and ſwallowed into the ſtomach; that it excited the veſſels, which conſtitute the ſtomach, into the greateſt irritative motion like arſenic; *which might not be perceived, and yet might render that organ paralytic or inirritable in a moment of time*; as animals ſometimes die by one ſingle exertion, and conſequent paralyſis, without a ſecond ſtruggle; as by lightning, or being ſhot through the back part of the brain; of both which I have ſeen inſtances. I had once an opportunity of inſpecting two oxen, a few minutes after they were killed by lightning under a crab-tree on moiſt ground in long graſs; and obſerved, that they could not have ſtruggled, as the graſs was not preſſed or bent near them; I have alſo ſeen two horſes ſhot through the cerebellum, who never once drew in their legs after they firſt ſtretched them out, but died inſtantaneouſly; in a ſimilar manner the lungs ſeem to be rendered inſtantly inanimate by the fumes of burning ſulphur.

The lungs may be ſometimes primarily affected with contagious matter floating in the atmoſphere as well as the ſtomach, as mentioned in article 9. of this Supplement. But probably this may occur much leſs frequently, becauſe the oxygene of the atmoſphere does not appear to be taken into the blood by animal abſorption, as the ſaliva in the ſtomach, but paſſes through the moiſt membranes

into

into the blood, like the ethereal fluids of electricity or heat, or by chemical attraction, and in consequence the contagious matter may be left behind; except it may sometimes be absorbed along with the mucus; of which however in this case there appeared no symptoms.

The tonsils are other organs liable to receive contagious matter, as in the small-pox, scarlet-fever, and in other sensitive inirritated fevers; but no symptom of this appeared here, as the tonsils were at no time of the fever inflamed, though they were in this child previously uncommonly large.

The pain of the forehead does not seem to have been of the internal parts of the head, because the nerves, which serve the stomach, are not derived from the anterior part of the brain; but it seems to have been owing to a torpor of the external membranes about the forehead from their direct sympathy with those of the stomach; that is, from the deficient excitement of the sensorial power of association; and seemed in some measure to be relieved by the emetics and blisters.

The pulsations of the heart were weaker and in consequence quicker than natural, owing to their direct sympathy with the torpid peristaltic motions of the stomach; that is to the deficient excitement of the sensorial power of association.

The action of the cutaneous capillaries and absorbents were stronger than natural, as appeared by

by the perpetual heat and dryneſs of the ſkin; which was owing to their reverſe ſympathy with the heart and arteries. This weaker and quicker action of the heart and arteries, and the ſtronger action of the cutaneous capillaries and abſorbents, continued throughout the diſeaſe, and may be ſaid to have conſtituted the fever, of which the torpor of the ſtomach was the remote cauſe.

His tongue was not very much furred or very dry, nor his breath very hot; which ſhewed, that there was no great increaſe of the action of the mucous abſorbents, nor of the pulmonary capillaries, and yet ſufficient to produce great emaciation. His urine was nearly natural both in quantity and colour; which ſhewed, that there was no increaſe of action either of the kidneys, or of the urinary abſorbents.

The bathing his legs and hands and face for half an hour twice a day ſeemed to refreſh him, and ſometimes made his pulſe ſlower, and thence I ſuppoſe ſtronger. This ſeems to have been cauſed by the water, though ſubtepid, being much below the heat of his ſkin, and conſequently contributing to cool the capillaries, and by ſatiating the abſorbents to relieve the uneaſy ſenſation from the dryneſs of the ſkin.

He continued the uſe of three drops of tincture of opium from about the eighth day to the twenty-fourth, and for the three preceding days took along with it two large ſpoonfuls of an infuſion

of

of bark in equal parts of wine and water. The former of theſe by its ſtimulus ſeemed to decreaſe his languor for a time, and the latter to ſtrengthen his returning power of digeſtion.

The daily exacerbations or remiſſions were obſcure, and not well attended to; but he appeared to be worſe on the fourteenth or fifteenth days, as his pulſe was then quickeſt, and his inattention greateſt; and he began to get better on the twentieth or twenty-firſt days of his diſeaſe; for the pulſe then became leſs frequent, and his ſkin cooler, and he took rather more food: theſe circumſtances ſeemed to obſerve the quarter periods of lunation.

XIV. *Termination of continued Fever.*

1. When the ſtomach is primarily affected with torpor not by defect of ſtimulus, but in conſequence of the previous exhauſtion of its ſenſorial power; and not ſecondarily by its aſſociation with other torpid parts; it ſeems to be the general cauſe of the weak pulſations of the heart and arteries, and the conſequent increaſed action of the capillaries, which conſtitute continued fever with weak pulſe. In this ſituation if the patient recovers, it is owing to the renovation of life in the torpid ſtomach, as happens to the whole ſyſtem in winter-ſleeping animals. If he periſhes, it

it is owing to the exhauſtion of the body for want of nouriſhment occaſioned by indigeſtion; which is haſtened by the increaſed actions of the capillaries and abſorbents.

2. When the ſtomach is primarily affected by defect of ſtimulus, as by cold or hunger; or ſecondarily by defect of the power of aſſociation, as in intermittent fevers; or laſtly in conſequence of the introduction of the ſenſorial power of ſenſation, as in inflammatory diſeaſes; the actions of the heart and arteries are not diminiſhed, as when the ſtomach is primarily affected with torpor by its previous exhauſtion of ſenſorial power, but become greatly increaſed, producing irritative or inflammatory fever. Where this fever is continued, though with ſome remiſſions and exacerbations, the exceſſive action is at length ſo much leſſened by expenditure of ſenſorial power, as to gradually terminate in health; or it becomes totally exhauſted, and death ſucceeds the deſtruction of the irritability and aſſociability of the ſyſtem.

3. There is alſo another termination of the diſeaſes in conſequence of great torpor of the ſtomach, which are not always termed fevers; one of theſe is attended with ſo great and univerſal torpor, that the patient dies in the firſt cold fit; that is, within twelve hours or leſs of the firſt ſeizure; this is commonly termed ſudden

death. But the quickneſs of the pulſe, and the coldneſs with ſhuddering, and with ſick ſtomach, diſtinguiſhed a caſe, which I lately ſaw, from the ſudden deaths occaſioned by apoplexy, or ruptured blood-veſſels.

In hemicrania I believe the ſtomach is always affected ſecondarily, as no quickneſs of pulſe generally attends it, and as the ſtomach recovers its activity in about two whole days. But in the following caſe, which I ſaw laſt week, I ſuppoſe the ſtomach ſuddenly became paralytic, and cauſed in about a week the death of the patient. Miſs ————, a fine young lady about nineteen, had bathed a few times, about a month before, in a cold ſpring, and was always much indiſpoſed after it; ſhe was ſeized with ſickneſs, and cold ſhuddering, with very quick pulſe, which was ſucceeded by a violent hot fit; during the next cold paroxyſm ſhe had a convulſion fit; and after that ſymptoms of inſanity, ſo as to ſtrike and bite the attendants, and to ſpeak furious language; the ſame circumſtances occurred during a third fit, in which I believe a ſtrait waiſtcoat was put on, and ſome blood taken from her; during all this time her ſtomach would receive no nutriment, except once or twice a little wine and water. On the ſeventh day of the diſeaſe, when I ſaw her, the extremities were cold, the pulſe not to be counted, and ſhe was unable to ſwallow, or to ſpeak; a clyſter was uſed with turpentine and muſk

muſk and opium, with warm fomentations, but ſhe did not recover from that cold fit.

In this caſe the convulſion fit and the inſanity ſeem to have been violent efforts to relieve the diſagreeable ſenſation of the paralytic ſtomach; and the quick pulſe, and returning fits of torpor and of orgaſm, evinced the diſeaſe to be attended with fever, though it might have been called anorexia maniacalis, or epileptica.

4. Might not many be ſaved in theſe fevers with weak pulſe for a few weeks by the introduction of blood into a vein, once in two or three days; which might thus give further time for the recovery of the torpid ſtomach? Which ſeems to require ſome weeks to acquire its former habits of action, like the muſcles of paralytic patients, who have all their habits of voluntary aſſociations to form afreſh, as in infancy.

If this experiment be again tried on the human ſubject, it ſhould be ſo contrived, that the blood in paſſing from the well perſon to the ſick one ſhould not be expoſed to the air; it ſhould not be cooled or heated; and it ſhould be meaſured; all which may be done in the following manner. Procure two ſilver pipes, each about an inch long, in the form of funnels, wide at top, with a tail beneath, the former ſomething wider than a ſwan-quill, and the latter leſs than a ſmall crow-quill. Fix one of theſe ſilver funnels by its wide end to one

end

end of the gut of a chicken freſh killed about four or ſix inches long, and the other to the other end of the gut; then introduce the ſmall end of one funnel into the vein of the arm of a well perſon downwards towards the hand; and laying the gut with the other end on a water-plate heated to 98 degrees in a very warm room, let the blood run through it. Then preſſing the finger on the gut near the arm of the well perſon, ſlide it along ſo as to preſs out one gutful into a cup, in order to aſcertain the quantity by weight. Then introduce the other end of the other funnel into a ſimilar vein in the arm of the ſick perſon upwards towards the ſhoulder; and by ſliding one finger, and then another reciprocally, along the chicken's gut, ſo as to compreſs it, from the arm of the well perſon to the arm of the ſick one, the blood may be meaſured, and thus the exact quantity known which is given and received. See Claſs I. 2. 3. 25.

XV. *Inflammation excited in Fever.*

1. When the actions of any part of the ſyſtem of capillaries are excited to a certain degree, ſenſation is produced, along with a greater quantity of heat, as mentioned in the fifth article of this ſupplement. When this increaſed capillary action becomes ſtill more energetic, by the combined

bined ſenſorial powers of ſenſation with irritation, new fibres are ſecreted, or new fluids, (which harden into fibres like the mucus ſecreted by the ſilk-worm, or ſpider, or pinna,) from which new veſſels are conſtructed; it is then termed inflammation: if this exiſts in the capillary veſſels of the cellular membrane or ſkin only, with feeble pulſations of the heart and arteries, the febris ſenſitiva inirritata, or malignant fever, occurs; if the coats of the arteries are alſo inflamed, the febris ſenſitiva irritata, or inflammatory fever, exiſts.

In all theſe fevers the part inflamed is called a phlegmon, and by its violent actions excites ſo much pain, that is, ſo much of the ſenſorial power of ſenſation, as to produce more violent actions, and inflammation, throughout the whole ſyſtem. Whence great heat from the excited capillaries of the ſkin, large and quick pulſations of the heart, full and hard arteries, with great univerſal ſecretions and abſorptions. Theſe perpetually continue, though with exacerbations and remiſſions; which ſeem to be governed by ſolar or lunar influence.

2. In this ſituation there generally, I ſuppoſe, exiſts an increaſed activity of the ſecerning veſſels of the brain, and conſequently an increaſed production of ſenſorial power; in leſs violent quantity of this diſeaſe however the increaſe of the

action of the heart and arteries may be owing ſimply to the accumulation of ſenſorial power of aſſociation in the ſtomach, when that organ is affected by ſympathy with ſome inflamed part. In the ſame manner as the capillaries are violently and permanently actuated by the accumulation of the ſenſorial power of aſſociation in the heart and arteries, when the ſtomach is affected primarily by contagious matter, and the heart and arteries ſecondarily. Thus I ſuſpect, that in the diſtinct ſmall-pox the ſtomach is affected ſecondarily by ſympathy with the infected tonſils or inoculated arm; but that in the confluent ſmall-pox the ſtomach is affected primarily, as well as the tonſils, by contagious matter mixed with the ſaliva, and ſwallowed.

3. In inflammatory fevers with great arterial action, as the ſtomach is not always affected with torpor, and as there is a direct ſympathy between the ſtomach and heart, ſome people have believed, that nauſeating doſes of ſome emetic drug, as of antimonium tartarizatum, have been adminiſtered with advantage, abating by direct ſympathy the actions of the heart. This theory is not ill-founded, and the uſe of digitalis, given in ſmall doſes, as from half a dram to a dram of the ſaturated tincture, two or three times a day, as well as other leſs violent emetic drugs, would be worth the attention of hoſpital phyſicians.

In

In three cases of what I believed to be inflammatory rheumatism, two of them attended with pain of the side, and difficult respiration, and the other with swelled joints, after repeated venesections and moderate cathartics, and mild doses of antimonials, without success, the tincture of digitalis given in the small dose of ten drops every six hours, appeared to abate the quickness and hardness of the pulse in two or three or four days, without inducing any degree of sickness.

Sickness might also be produced probably with advantage by whirling the patient in a chair suspended from the ceiling by two parallel cords; which after being revolved fifty or a hundred times in one direction, would return with great circular velocity, and produce vertigo, similar I suppose to sea-sickness. And lastly the sickness produced by respiring an atmosphere mixed with one tenth of carbonated hydrogen, discovered by Mr. Watt, and published by Dr. Beddoes, would be well worthy exact and repeated experiment.

4. Cool air, cool fomentations, or ablutions, are also useful in this inflammatory fever; as by cooling the particles of blood in the cutaneous and pulmonary vessels, they must return to the heart with less stimulus, than when they are heated above the natural degree of ninety-eight. For this purpose snow and ice have been scattered on the patients in Italy; and cold bathing has been

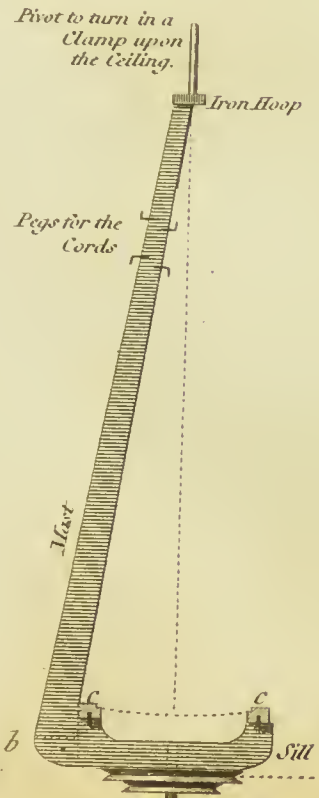
uſed at the eruption of the ſmall-pox in China, and both, it is ſaid, with advantage. See Claſs III. 2. 1. 12. and Suppl. I. 8.

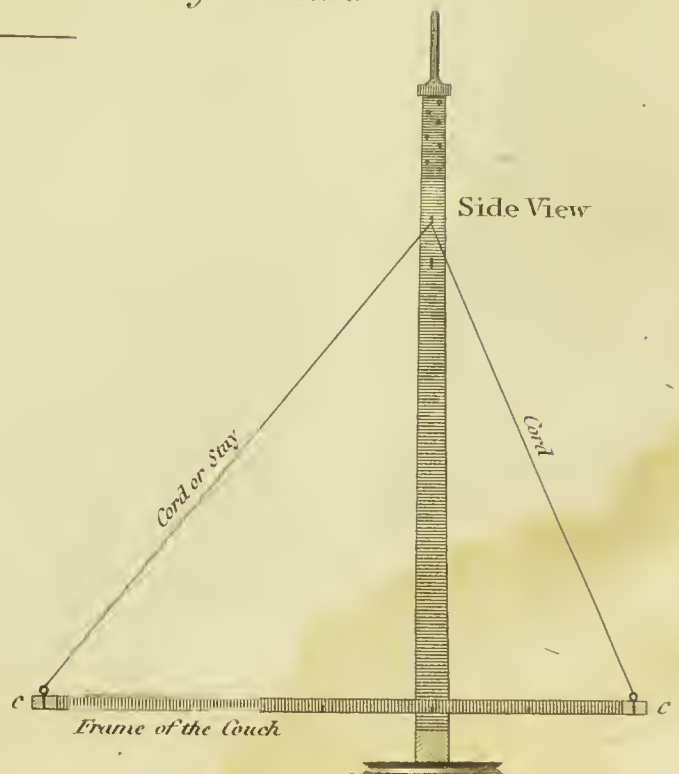
5. The lancet however with repeated mild catharties is the great agent in deſtroying this enormous excitement of the ſyſtem, ſo long as the ſtrength of the patient will admit of evacuations. Bliſters over the painful part, where the phlegmon or topical inflammation is ſituated, after great evacuation, is of evident ſervice, as in pleuriſy. Warm bathing for half an hour twice a day, when the patient becomes enfeebled, is of great benefit, as in peripneumony and rheumatiſm.

6. When other means fail of ſuccefs in abating the violent excitement of the ſyſtem in inflammatory diſeaſes, might not the ſhaved head be covered with large bladders of cold water, in which ice or ſalt had been recently diſſolved; and changed as often as neceſſary, till the brain is rendered in ſome degree torpid by cold?—Might not a greater degree of cold, as iced water, or ſnow, be applied to the cutaneous capillaries?

7. Another experiment I have frequently wiſhed to try, which cannot be done in private practice, and which I therefore recommend to ſome hoſpital phyſician; and that is, to endeavour to ſtill the violent actions of the heart and arteries, after due

The length of the Mast must be suited to the height of the Ceiling.— The angle at b must be secured by a Plate of Iron screwed on the outside. — The cast Iron Cup (a) for the bottom Pivot may have three spikes to fix it to the Floor. — The whole of the Wood work may be made of Oak or Elm.— The frame of the Couch (c c) is not fixed to the Sill, but the latter has two projecting Iron Pegs, which go into holes in the Frame, so that the centre of motion may be changed at pleasure.— When not in use, the Frame may be lifted off the Sill, and set up paralel to the Mast, in a corner of the room.— There are four Cords or Stays, one fastned to each corner of the Frame of the Couch or Cott, and their upper ends tied to the Pegs of the Mast.





due evacuations by venesection and cathartics, by gently compressing the brain. This might be done by suspending a bed, so as to whirl the patient round with his head most distant from the centre of motion, as if he lay across a mill-stone, as described in Sect. XVIII. 20. For this purpose a perpendicular shaft armed with iron gudgeons might have one end pass into the floor, and the other into a beam in the ceiling, with an horizontal arm, to which a small bed might be readily suspended.

By thus whirling the patient with increasing velocity sleep might be produced, and probably the violence of the actions of the heart and arteries might be diminished in inflammatory fevers; and, as it is believed, that no accumulation of sensorial power would succeed a torpor of the origin of the nerves, either thus procured by mechanical compression, or by the bladder-cap of cold water above described, the lives of thousands might probably be saved by thus extinguishing the exacerbations of febrile paroxysms, or preventing the returns of them.

In fevers with weak pulse sleep, or a degree of stupor, thus produced, might prevent the too great expenditure of sensorial power, and thus contribute to preserve the patient. See Class I. 2. 5. 10. on stupor. What might be the consequence of whirling a person with his head next the centre of motion, so as to force the blood from the brain

into the other parts of the body, might be discovered by cautious experiment without danger, and might probably add to our ability of curing fever.

Mr. Kelly, in his obſervations on compreſſion, Edinb. 1797, aſſerts, that by compreſſing the two ſubclavian arteries, as they paſs over the firſt rib, more blood will compreſs the brain, and produce a kind of apopleſtic ſtate ſimilar to that, which may occur by the centrifugal force, if the patient was whirled round as above deſcribed. And adds, that by this compreſſion of the two ſubclavian arteries a greater quantity of blood will be circulated through the head, whence the patient ſoon complains of drowſineſs and vertigo; and that hence different ſpecies of headachs are ſoon removed, eſpecially thoſe which depend on defect of ſtimulation.

XVI. *Recapitulation.*

1. The ſenſorial power cauſes the contraction of the fibres, and is excited into action by four different circumſtances, by the ſtimulus of external bodies, by pain or pleaſure, by deſire or averſion, or by the previous motions of other contracting fibres. In the firſt ſituation it is called the ſenſorial power of irritation, in the ſecond the ſenſorial power of ſenſation, in the third the ſen-

ſorial

ſorial power of volition, and in the fourth the ſenſorial power of aſſociation.

Many parts of the body are excited into perpetual action, as the ſanguiferous veſſels conſiſting of the heart, arteries, and veins; others into nearly perpetual action, as the conglomerate and capillary glands; and others into actions ſtill ſomewhat leſs frequent, as the alimentary canal, and the lacteal and lymphatic abſorbents with their conglobate glands: all theſe are principally actuated by the ſenſorial powers of irritation, and of aſſociation; but in ſome degree or at ſome times by thoſe of ſenſation, and even of volition. There are three kinds of ſtimulus, which may eaſily be occaſionally diminiſhed, that of heat on the ſkin, of food in the ſtomach, and of the oxygenous part of the atmoſphere, which mixes with the blood in reſpiration, and ſtimulates the heart and arteries.

2. When any parts, which are naturally excited into perpetual action by ſtimulus, become torpid or leſs active from decreaſe of that ſtimulus; there firſt occurs a decreaſe of the activity of the parts next catenated with them; thus going into cold water produces a torpor of the capillary veſſels of the lungs, as is known by the difficult reſpiration, which immediately occurs; for the ſenſorial power of aſſociation, which naturally contributes to actuate the lungs, is now

leſs excited by the decreaſed actions of the cutaneous veſſels, with which they are catenated. This conſtitutes the cold fit of fever.

There next occurs an accumulation of the ſenſorial power of irritation in the parts, which were torpid from defect of ſtimulus, as the cutaneous veſſels for inſtance when expoſed to cold air; and a ſimilar accumulation of the ſenſorial power of aſſociation occurs in the parts which were catenated with the former, as the veſſels of the lungs in the example above mentioned. Whence, if the ſubduction of ſtimulus has not been too great, ſo as to impair the health of the part, the activity of the irritative motions returns, even though the ſtimulus continues leſs than uſual; and thoſe of the aſſociate motions become conſiderably increaſed, becauſe theſe latter are now excited by the previous fibrous motions, which now act as ſtrong or ſtronger than formerly, and have alſo acquired an accumulation of the ſenſorial power of aſſociation. This accounts for the curious event of our becoming warm in a minute or two after remaining in water of about 80 degrees of heat, as in the bath at Buxton; or in the cold air of a froſty morning of about 30 degrees of heat.

But if the parts thus poſſeſſed of the accumulated ſenſorial powers of irritation and of aſſociation be expoſed again to their natural quantity of ſtimulus, a great exceſs of activity ſupervenes; becauſe

becauſe the fibres, which poſſeſs accumulated irritation, are now excited by their uſual quantity of ſtimulus; and thoſe which poſſeſs accumulated aſſociation, are now excited by double or treble the quantity of the preceding irritative fibrous motions, with which they are catenated; this conſtitutes the hot fit of fever.

Another important circumſtance occurs, when the parts, which are torpid from decreaſed ſtimulus, do not accumulate a quantity of ſenſorial power ſufficient for the purpoſe of renewing their own natural quantity of action; but are nevertheleſs not ſo torpid, as to have the life of the part impaired. In this ſituation the ſuperabundance of the accumulated power of irritation contributes to actuate the aſſociate motions next catenated with them. Thus, when a perſon breathes air with leſs oxygene than natural, as by covering his head in bed, and thus reſpiring the ſame atmoſphere repeatedly, the heart and arteries become leſs active by defect of the ſtimulus of oxygene; and then the accumulation of ſenſorial power of irritation becomes inſtantly very great, as theſe organs are ſubject to perpetual and energetic action. This accumulation nevertheleſs is not ſo great as to renew their own activity under this defect of ſtimulus, but yet is in ſufficient abundance to increaſe the aſſociability of the next link of catenation, that is, to actuate the capillaries of the ſkin with great and perpetual increaſe

of

of energy. This resembles continued fever with weak pulse; in which the accumulation of the sensorial power caused by the lessened motions of the heart and arteries, actuates the capillaries with increase of energy.

3. When the accumulation of the sensorial power of association, which is caused as above explained by deficient excitement owing to the lessened quantity of action of the irritative fibrous motions, with which the associate train is catenated, is not in quantity sufficient to renew the natural actions of the first link of an associate train of motions; it is nevertheless frequently so abundant as to actuate the next link of the associated train with unnatural energy by increasing its associability; and that in a still greater degree if that second link of the associated train was previously in a torpid state, that is, had previously acquired some accumulation of the sensorial power of association. This important circumstance of the animal economy is worthy our most accurate attention. Thus if the heart and arteries are deprived of their due quantity of the stimulus of oxygene in the blood, a weak and quick pulse ensues, with an accumulation of the sensorial power of irritation; next follows an increase of the action of the capillaries by the superabundance of this accumulated power of irritation; but there also exists an accumulation of the power of

of aſſociation in theſe acting capillaries, which is not now excited by the deficient actions of the heart and arteries; but which by its abundance contributes to actuate the next link of aſſociation, which is the ſick ſtomach in the caſe related from Sydenham in Claſs IV. 1. 1. 2. and explained in this Supplement I. 4. And as this ſick ſtomach was in a previous ſtate of torpor, it might at the ſame time poſſeſs an accumulation of ſome ſenſorial power, which, if it was of aſſociation, would be thus more powerfully excited by the increaſed actions of the capillaries; which exiſted in conſequence of the weak action of the heart and arteries. This alſo reſembles in ſome reſpects the continued fevers with weak pulſe, and with increaſed activity of the capillaries.

4. When a torpor of ſome irritative motions occurs from a previous exhauſtion of the ſenſorial power of irritation by the action of ſome very great ſtimulus, it is long before any accumulation of the ſenſorial power of irritation is produced; as is experienced in the ſickneſs and languor, which continues a whole day after a fit of drunkenneſs. But nevertheleſs there occurs an accumulation of the ſenſorial power of aſſociation in the firſt link of the aſſociate train of motions, which is catenated with theſe torpid irritative ones; which accumulation is owing to deficient excitement of that ſenſorial power in the firſt link

of

of the aſſociate train. This firſt link therefore exiſts alſo in a leſs active or torpid ſtate, but the accumulation of the ſenſorial power of aſſociation by its ſuperabundance contributes to actuate the ſecond link of the aſſociate train with unnatural quantity of motion; and that though its own natural quantity of the power of aſſociation is not excited by the deficient action of preceding fibrous motions.

When this happens to the ſtomach, as after its irritative motions have been much exerted from the unnatural ſtimulus of wine, or opium, or of contagious matter mixed with the ſaliva, a torpor or inactivity of it ſucceeds for a greater or leſs length of time; as no accumulation of the ſenſorial power of irritation can occur, till the natural quantity, which has been previouſly expended, is firſt reſtored. Then the heart and arteries, which are next in catenation, become leſs active from the want of ſufficient excitement of the ſenſorial power of aſſociation, which previouſly contributed to actuate them. This ſenſorial power of aſſociation therefore becomes accumulated, and by its ſuperabundance contributes to actuate the link next in aſſociation, which has thus acquired ſo great a degree of aſſociability, as to overbalance the leſs quantity of the excitement of it by the torpid action of the previous or firſt aſſociate link. This happens to the capillaries, when the heart and arteries are affected as above by the torpor of the ſtomach, when it is occaſioned

occaſioned by previous great expenditure of its ſenſorial power, and thus conſtitutes fever with weak pulſe, which is here termed inirritative fever, typhus mitior.

5. When a deficiency of ſtimulus is too great or too long continued, ſo as to impair the life of the part, no further accumulation of ſenſorial power occurs; as when the ſkin is long expoſed to cold and damp air. In that caſe the link in catenation, that is, the firſt of the aſſociate train, is rendered torpid by defect of excitement of its uſual quantity of the ſenſorial power of aſſociation, and from there being no accumulation of the ſenſorial power of irritation to increaſe its aſſociability, and thus to contribute to actuate it by overbalancing the defect of the excitement of its aſſociation.

Thus on riding long and ſlowly on a cold and damp day, the exhalation of the vapour, which is impinged on the ſkin, as the traveller proceeds, carries away his warmth faſter, than it is generated within the ſyſtem; and thus the capillaries of the ſkin have their actions ſo much impaired after a time, that no accumulation of the ſenſorial power of irritation occurs; and then the ſtomach, the motions of which are catenated with thoſe of the capillaries, ceaſes to act from the deficient excitement of the power of aſſociation; and indigeſtion and flatulency ſucceed, inſtead of the

increaſed digeſtion and hunger, which occur, when the cutaneous capillaries are expoſed to a leſs degree of cold, and for a ſhorter time. In which latter ſituation the accumulation of the ſenſorial power of irritation increaſes by its ſuperabundance the aſſociability of the fibres of the ſtomach, ſo as to overbalance the defect of the excitement of their aſſociation.

6. The ſtomach is affected ſecondarily in fevers with ſtrong pulſe, as in thoſe with weak pulſe it is affected primarily. To illuſtrate this doctrine I ſhall relate the following caſe of Mr. Y———. He was a young man rather intemperate in the uſe of wine or beer, and was ſeized with a cold fit, and with a conſequent hot one with ſtrong pulſe; on examining his hypochondrium an oblong tumour was diſtinctly felt on the left ſide of the ſtomach, which extended ſix or eight inches downward, and was believed to be a tumour of the ſpleen, which thus occaſioned by its torpor the cold fit and conſequent hot fit of fever with ſtrong pulſe. This fever continued, though with remiſſions, for two or three weeks; and the patient repeatedly loſt blood, uſed cathartics with calomel and ſena, and had frequent antimonial and ſaline medicines. And after he was much weakened by evacuations, the peruvian bark and ſmall doſes of ſteel removed the fever, but the

tumour remained many years during the remainder of his life.

In this case the tumour of the spleen was occasioned by the torpor of the absorbent vessels; while the secerning vessels continued somewhat longer to pour their fluids into the cells of it. Then the inactivity of this viscus affected the whole system with torpor by the deficient excitement of the sensorial power of association, which contributes along with the irritation caused by their specific stimuli to actuate the whole sanguiferous, secerning, and absorbent vessels; and along with these the stomach, which possesses perhaps greater mobility, or promptitude to torpor or to orgasm, than any other part. And after a time all these parts recover their actions by the accumulation of their sensorial power of association. But the spleen not recovering its action from the accumulation of its power of irritation, as appeared from the continuance of the tumour, still affects the stomach by its defective irritative motions ceasing to excite the association, which ought to contribute to actuate it.

Hence the stomach continues torpid in respect to its motions, but accumulates its power of association; which is not excited into action by the defective motions of the spleen; this accumulation of the sensorial power of association now by its superabundance actuates the next link of associate motions, which consists of the heart and arteries,

arteries, into greater energy of action than natural, and thus causes fever with strong pulse; which, as it was supposed to be most frequently excited by increase of irritation, is called irritative fever or synocha.

Similar to this in the small-pox, which is given by inoculation, the stomach is affected secondarily, when the fever commences; and hence in this small-pox the pulsations of the heart and arteries are frequently stronger than natural, but never weaker, for the reasons above given. Whereas in that small pox, which is caused by the stomach being primarily affected, by the contagious matter being swallowed with the saliva, whether the tonsils are at the same time affected or not, the pulsations of the heart and arteries become weak, and the inirritative fever is produced, as explained above, along with the confluent small-pox. This unfolds the cause of the mildness of the inoculated small-pox; because in this disease the stomach is affected secondarily, whereas in the natural small-pox it is frequently affected primarily by swallowing the contagious matter mixed with saliva.

In the measles I suppose the contagious matter to be dissolved in the air, and therefore not liable to be mixed with the saliva; whereas the variolous matter is probably only diffused in the air, and thence more readily mixed with the saliva in the mouth during respiration. This difference appears more

more probable, as the ſmall-pox I believe is always taken at a leſs diſtance from the diſeaſed perſon than is neceſſary to acquire the meaſles. The contagion of the meaſles affects the membranes of the noſtrils, and the ſecretion of tears in conſequence, but never I ſuſpect the ſtomach primarily, but always ſecondarily; whence the pulſation of the heart and arteries is always ſtronger than natural, ſo as to bear the lancet at any period of the diſeaſe.

The great mildneſs ſometimes, and fatality at other times, of the ſcarlet fever may depend on the ſame circumſtance; that is, on the ſtomach being primarily or ſecondarily affected by the contagious matter, obſerving that the tonſils may be affected at the ſame time with the ſtomach. Should this prove to be the caſe, which future obſervations muſt determine, what certain advantage muſt ariſe from the inoculation of this diſeaſe! When it is received by the ſkin primarily I ſuppoſe no ſore throat attends it, nor fever with weak pulſe; when it is received by the ſtomach primarily, the tonſils are affected at the ſame time, and the torpor of the ſtomach produces inirritative fever, and the mortification of the tonſils ſucceeds.

We may hence conclude, that when the torpor of the ſtomach is either owing to defect of ſtimulus, which is not ſo great as to impair the life of the part, as in moderate hunger, or in

ſwallowing iced water, or when its torpor is induced by its catenation or aſſociation with other torpid parts, as in the commencement of intermittent fevers, and inoculated ſmall pox, that the ſubſequent action of the heart and arteries is generally increaſed, producing irritative fever. Which is owing to the accumulation of the ſenſorial power of irritation in one caſe, and of aſſociation in the other, contributing to actuate the next link of the catenated or aſſociated motions. But when the torpor of the ſtomach is induced by previous exhauſtion of its ſenſorial powers of irritation or of aſſociation by continued violent action, as by the ſtimulus of digitalis, or of contagious matter, or after intoxication from wine or opium, a weaker action of the heart and arteries ſucceeds, becauſe there is no accumulation of ſenſorial power, and a deficient excitement of aſſociation. And finally, as this weak action of the heart and arteries is not induced by exhauſtion of ſenſorial power, but by defect of the excitement of aſſociation, the accumulation of this power of aſſociation increaſes the action of the capillaries, and thus induces inirritative fever.

7. When any part of the ſyſtem acts very violently in fevers, the ſenſorial power of ſenſation is excited, which increaſes the actions of the moving ſyſtem; whereas the pain, which ariſes from

from decreaſed irritative motions, as in hemcrania, ſeems to exhauſt a quantity of ſenſorial power, without producing or increaſing any fibrous actions.

When the ſtomach is primarily affected, as in inirritative fevers from contagion, and in ſuch a manner as to occaſion pain, the action of the capillaries ſeems to be increaſed by this additional ſenſorial power of ſenſation, whence extenſive inflammation or mortification; but when the ſtomach and conſequently the heart and arteries continue their torpidity of action; as in confluent ſmall-pox, and fatal ſcarlatina; this conſtitutes ſenſitive inirritative fever, or typhus gravior.

But when the ſtomach is ſecondarily affected, if the ſenſorial power of ſenſation is excited, as in pleuriſy or peripneumony, the actions of the heart and arteries are violently increaſed, and of all the moving ſyſtem along with them. Thus the peripneumony is generally induced by the patient reſpiring very cold air, and this eſpecially after being long confined to warm air, or after being much fatigued and heated by exceſſive labour or exerciſe. For we can cover the ſkin with more clothes, when we feel ourſelves cold; but the lungs not having the perception of cold, we do not think of covering them, nor have the power to cover them, if we deſired it; and the torpor thus produced is greater, or of longer duration, in proportion to the previous expenditure of ſenſorial power by heat or exerciſe.

This torpor of the lungs affects the skin with shuddering, and the stomach is also secondarily affected; next follows the violent action of the lungs from the accumulation of the power of irritation, and an inflammation of them follows this violent action. While the stomach recovers its activity by the increase of the excitement of the sensorial power of association, and along with it the heart and arteries, and the whole moving system. Hence this inflammation occurs during the hot fit of fever, and no cold fit succeeds, because the excess of the sensorial power of sensation prevents a succeeding torpor.

These new motions of certain parts of the system produce increased secretions of nutritious or organic mucus, which forms new vessels; these new vessels by their unusual motions produce new kinds of fluids; which are termed contagious, because they have the power, when introduced into a healthy body, of producing similar actions and effects, with or without fever, as in the small-pox and measles, or in the itch and venereal disease.

If any of these contagious matters affect the stomach with torpor either by their stimulus immediately applied, or by its sympathy with the parts first diseased, a fever is produced with sickness and want of appetite; as in small-pox, and scarlatina. If the stomach is not affected by contagious matter, no fever succeeds, as in itch, tinea, syphilis.

All these contagious matters are conceived to be

be harmlefs, till they have been expofed to the air, either openly or through a moift membrane; from which they are believed to acquire oxygene, and thence to become fome kinds of animal acids. As the preparations of mercury cure venereal ulcers; as a quarter of a grain of fublimate diffolved in wine, and given thrice a day; this effect feems to be produced either by its ftimulating the abforbents in the ulcer to abforb the venereal matter before it has acquired oxygene; or by afterwards uniting with it chemically, and again depriving it of its acquired acidity. On either fuppofition it might probably be given with advantage in fmall-pox, and in all infectious difeafes, both previous to their commencement, and during their whole progrefs.

8. The cold fits of intermittent fevers are caufed by the torpor of fome part owing to deficient irritation, and of the other parts of the fyftem from deficient affociation. The hot fits are owing firft to the accumulation of irritation in the part primarily affected, if it recovers its action, which does not always happen; and fecondly to the accumulation of affociation in the other parts of the fyftem, which during health are fubject to perpetual action; and laftly alfo to the greater excitement of the power of affociation, when the part primarily affected recovers its irritability, and acts with greater energy than natural.

The deficient ſecretions in the cold fit depend on the torpor of the glandular ſyſtem; and the increaſed ſecretions in the hot fit on their more energetic action. The thirſt in the cold fit is owing to the deficient abſorption from the ſkin, cellular membrane, and bladder; the thirſt in the hot fit is owing to the too great diſſipation of the aqueous part of the blood. The urine is pale and in ſmall quantity in the cold fit from deficient ſecretion of it, and from deficient abſorption of its aqueous parts; it is high coloured, and ſometimes depoſits a ſediment, in the hot fit from the greater ſecretion of it in the kidneys, and the greater abſorption of its aqueous and ſaline part in the bladder. The dryneſs and ſcurf on the tongue and noſtrils are owing to the increaſed heat of the air expired from the lungs, and conſequent greater evaporation of the aqueous part of the mucus. The ſweats appear in conſequence of the declenſion of the hot fit, owing to the abſorbent veſſels of the ſkin loſing their increaſed action ſooner than the ſecerning ones; and to the evaporation leſſening as the ſkin becomes colder. The returns of the paroxyſms are principally owing to the torpor of ſome leſs eſſential part of the ſyſtem remaining after the termination of the laſt fit; and are alſo dependent on ſolar or lunar diurnal periods.

The torpor of the part, which induces the cold paroxyſm, is owing to deficient irritation occaſioned

ſioned either by the ſubduction of the natural ſtimuli of food, or water, or pure air, or by deficiency of external influences, as of heat, or of ſolar or lunar gravitation. Or ſecondly, in conſequence of the exhauſtion of ſenſorial power by great previous exertions of ſome parts of the ſyſtem, as of the limbs by great labour or exerciſe, or of the ſtomach by great ſtimulus, as by contagious matter ſwallowed with the ſaliva, or by much wine or opium previouſly taken into it. Or laſtly a torpor of a part may be occaſioned by ſome mechanic injury, as by a compreſſion of the nerves of the part, or of their origin in the brain; as the ſitting long with one leg croſſed over the other occaſions numbneſs, and as a torpor of the ſtomach with vomiting frequently precedes paralytic ſtrokes of the limbs.

As ſleep is produced, either by defect of ſtimulus, or by previous exhauſtion of ſenſorial power; ſo the accumulation of the ſenſorial power of volition in thoſe muſcles and organs of ſenſe, which are generally obedient to it, awakens the ſleeping perſon; when it has increaſed the quantity of voluntarity ſo much as to overbalance the defect of ſtimulus in one caſe, and the exhauſtion of ſenſorial power in the other; which latter requires a much longer time of ſleep than the former. So the cold paroxyſm of fever is produced either by defect of ſtimulus, or by previous exhauſtion of the ſenſorial power

of ſome part of the ſyſtem; and the accumulation of the ſenſorial power of irritation in that part renews the action of it, when it has increaſed its irritability ſo much as to overbalance the defect of ſtimulus in one caſe, and the exhauſtion of ſenſorial power in the other; which latter requires a much longer torpor or cold fit than the former.

But in the cold paroxyſm of fever, beſides the torpor of one part of the ſyſtem from defect of irritation, the remainder of it becomes torpid owing to defect of excitement of the ſenſorial power of aſſociation by the leſſened action of the part firſt affected. This torpor of the general ſyſtem remains, till the accumulation of the ſenſorial power of aſſociation has increaſed the aſſociability ſo much as to overbalance the defect of the excitement of aſſociation; then the torpor ceaſes, and if the firſt affected part has recovered its activity, the other parts are all thrown into exceſs of action by their increaſed aſſociability, and the hot fit of fever is produced.

9. In the continued fevers with ſtrong pulſe the ſtomach is affected ſecondarily, and thus acts feebly from deficient excitement of the power of aſſociation; but the accumulation of the power of aſſociation thus produced in an organ ſubject to perpetual and energetic action, is ſo great as to affect the next link of the aſſociate train, which conſiſts of the heart and arteries; theſe therefore are exerted perpetually with increaſe of action.

In

In continued fevers with weak pulſe the torpid ſtomach is affected primarily by previous exhauſtion of its irritability by ſtimulus, as of contagious matter ſwallowed into it. The heart and arteries act feebly from deficient excitement of the power of aſſociation, owing to the torpor of the ſtomach, with which they are catenated; but the accumulation of the power of aſſociation, thus produced in organs ſubject to perpetual and energetic motion, is ſo great, as to affect the next link of the aſſociate train; which conſiſts of the capillaries of the ſkin or other glands; theſe therefore are exerted perpetually with great increaſe of action.

The continued fevers with ſtrong pulſe terminate by the reduction or exhauſtion of the ſenſorial power by violent action of the whole ſyſtem; which is followed either by return of health with the natural quantity of irritability, and of aſſociability, or by a total deſtruction of them both, and conſequent death.

In continued fevers with weak pulſe the ſtomach remains torpid during the whole courſe of the fever; and at length by the recovery of its irritability and ſenſibility effects the cure of it. Which generally happens about the firſt, ſecond, or third quarter of the lunar period, counted from the commencement of the diſeaſe, or continues a whole lunation, and ſometimes more; which gave riſe to what are termed critical days. See Sect. XXXVI. 4. on this ſubject. If the ſtomach

mach does not recover from its torpor, the patient becomes emaciated, and dies exhausted by the continuance of the increased action of the capillaries and absorbents, and the want of nourishment.

The cure of continued fever with weak pulse consists first in weakening the undue action of the capillaries of the skin by ablution with cold water from 32 to 80 degrees of heat; or by exposing them to cool air. Secondly, by invigorating the actions of the stomach, by decreasing them for a time, and thence accumulating the power of irritation, as by an emetic, or by iced water, or iced wine. Or by increase of stimulus, as by bark, wine, opium, and food, in small quantities frequently repeated. Or by renewing the action of the stomach by slight electric shocks. Or by fomenting it frequently with water heated to 96 or 100 degrees. Or lastly by exciting its power of association with other parts of the system, as by a blister; which succeeds best when the extremities are cool; or by swinging, as in vertigo rotatoria.

If by the stimulus of the Peruvian bark on the fibres of the stomach, they regain their due action, the heart and arteries also regain their due action; as their sensorial power of association is now excited, and expended as usual. And as there is then no accumulation of sensorial power in the heart and arteries, the capillaries cease to act with too great energy, and the fever is cured.

Thirdly.

Thirdly. If the heart and arteries could be themſelves ſtimulated into greater action, although the ſtomach remained torpid, they might probably by expending a greater quantity of the ſenſorial power of irritation, prevent an accumulation of the ſenſorial power of aſſociation, (for theſe may poſſibly be only different modes of action of the ſpirit of animation,) and thus the too great action of the capillaries might be prevented and the fever ceaſe. This new mode of cure might poſſibly be accompliſhed, if the patient was to breathe a gallon or two of pure or diluted oxygene gas frequently in a day; which by paſſing through the moiſt membranes of the lungs and uniting with the blood might render it more ſtimulant, and thus excite the heart and arteries into greater action.

Fourthly. Greater energy might probably be given to the whole ſyſtem, and particularly to thoſe parts which act too feebly in fevers, as the ſtomach and the heart and arteries, if the action of the ſecerning veſſels of the brain could be increaſed in energy; this is probably one effect of all thoſe drugs, which when given in large quantity induce intoxication, as wine and opium. And when given with great caution in ſmall quantities uniformly repeated, as from three drops to five of the tincture of opium, but not more, every ſix hours, I believe they ſupply an efficacious medicine in fevers with great arterial debility; and the

the more ſo, if the Peruvian bark be exhibited alternately every ſix hours along with them. There are other means of exciting the veſſels of the brain into action; as firſt by decreaſing the ſtimulus of heat by temporary cold fomentation; ſecondly, increaſing the ſtimulus of heat by long continued warm fomentation; thirdly, by electricity, as very ſmall ſhocks paſſed through it in all directions; and laſtly by bliſters on the head. All thoſe require to be uſed with great caution, and eſpecially where there exiſts an evident ſtupor, as the removing of that is I believe frequently injurious. See ſtupor, Claſs I. 2. 5. 10.

The cure of fever with ſtrong pulſe conſiſts in the repeated uſe of veneſection, gentle catharties, diluents; medicines producing ſickneſs, as antimonials, digitalis; or the reſpiration of carbonated hydrogen; or by reſpiration of atmoſpheric air lowered by a mixture of hydrogen, azote, or carbonic acid gas, or by compreſſing the brain by whirling in a decumbent poſture, as if lying acroſs a horizontal mill-ſtone. See the former parts of this ſupplement for the methods of cure both of fevers with ſtrong and weak pulſe.

10. When any difficulty occurs in determining the weak pulſe from the ſtrong one, it may generally be aſſiſted by counting its frequency. For when an adult patient lies horizontally in a cool room, and is not hurried or alarmed by the approach

proach of his phyſician, nor ſtimulated by wine or opium, the ſtrong pulſe ſeldom exceeds 118 or 120 in a minute; and the weak pulſe is generally not much below 130, and often much above that number; except where a patient has naturally a pulſe ſlower than uſual in his healthy ſtate. Secondly in ſitting up in bed, or changing the horizontal to a perpendicular poſture, the quickneſs of the weak pulſe is liable immediately to increaſe 10 or 20 pulſations in a minute, which does not I believe occur in the ſtrong pulſe, when the patient has reſted himſelf after the exertion of riſing.

I ſhall here inſert a remark on the general uſe of ſtimulating materials, whether medicinal or culinary, to counteract or prevent debility. When a ſtimulating material is exhibited, as the Peruvian bark, or opium, or wine; it ſhould be continued but a certain time, as half a lunation, or a whole lunation. If the whole ſyſtem be ſtimulated into increaſed exertion, as by wine or opium, there appears to be a temporary increaſed ſecretion of ſenſorial power in the brain, ſo long as this ſtimulus affects the ſyſtem. If a part only of the ſyſtem be ſtimulated, as by the exhibition of ſpices, eſſential oils, or bitter medicines, or metallic ones, then the ſtimulated organ has derived to it a greater quantity of ſenſorial power, or a greater ſecretion of it is produced in that part of the brain, where the ſtimulated nerves ariſe.

Which is probably owing to the ſympathy of the ſtimulated extremity of every nerve, or its organ of ſenſe, with the other extremity of it in the brain, in the ſame manner as when the excretory duct of a gland is ſtimulated, a greater ſecretion is produced in the body of it, as when the ducts of the lacrymal glands in the eyes, or of the ſalivary glands in the mouth are ſtimulated by duſt or acrid materials.

Now if a ſtimulating medicine be given at certain intervals of time, as the Peruvian bark or wine in fevers, the increaſed action of a part or of the whole ſyſtem ſoon becomes a link of the aſſociated circle of diurnal actions, and may be ſaid to become habitual.

The quantity of the ſtimulating medicine may then be diminiſhed, and yet the increaſed activity of the ſyſtem will continue; becauſe the increaſed exertions are now produced partly by the ſenſorial power of aſſociation, as they are become a part of the diurnal circle of actions. And finally the ſtimulating medicine may be totally omitted, and yet the increaſed activity of the ſyſtem continue for the ſame reaſon.

On this circumſtance depends the power of the bitter medicines, as the bark, and other ſtimulating materials, as beer and wine, in preventing the returns of the cold paroxyſms of fevers, and in ſtrengthening the ſyſtem, which increaſe of irritability, that is of ſtrength, continues after the uſe of the medicine is withdrawn.

But

But on the contrary, if the ſtimulating material be continued much longer than one lunation, the whole ſyſtem, or the ſtimulated organ alone, is excited into too forcible action by the two ſenſorial powers of irritation, and of aſſociation; and conſequently in proceſs of time loſes in ſome degree both its irritability and its aſſociability; and inactivity or torpor ſucceeds; which conſtitutes weakneſs, as is ſeen in all thoſe, who accuſtom themſelves to dram-drinking.

Hence wine or opium, or Peruvian bark, may be continued twice or four times a day for half a lunation, or for a whole one with advantage in diſeaſes of debility, for the purpoſe of gaining both diurnal and monthly aſſociations of activity. But ſhould not be much longer continued; as a conſequent debility will then be liable to ſucceed.

XVII. *Concluſion.*

Thus have I given an outline of what may be termed the ſympathetic theory of fevers, to diſtinguiſh it from the mechanic theory of Boerhaave, the ſpaſmodic theory of Hoffman and of Cullen, and the putrid theory of Pringle. What I have thus delivered, I beg to be conſidered rather as obſervations and conjectures, than as things explained and demonſtrated; to be conſidered as a foundation

foundation and a ſcaffolding, which may enable future induſtry to erect a ſolid and a beautiful edifice, eminent both for its ſimplicity and utility, as well as for the permanency of its materials,—which may not moulder, like the ſtructures already erected, into the ſand of which they were compoſed; but which may ſtand unimpaired, like the Newtonian philoſophy, a rock amid the waſte of ages!

LINES,

LINES,

TO BE PLACED AT THE END OF

ZOONOMIA.

BY A FRIEND.

JAMQUE OPUS EXEGI.

The work is done!—nor Folly's active rage,
Nor Envy's ſelf, ſhall blot the golden page;
Time ſhall admire, his mellowing touch employ,
And mend the immortal tablet, not deſtroy.

ZOONOMIÆ AUCTORI

S. P. D.

AMICUS.

CURRUS TRIUMPHALIS MEDICINÆ.

Currus it Hygeiæ, Medicus movet arma triumphans,
Undique victa fugit lurida turma mali.——
Laurea dum Phœbi viridis tua tempora cingit,
Nec mortale ſonans Fama coronat opus;
Poſt equitat trepidans, repetitque Senectus in aurem,
Voce canens ſtridulâ, "ſis memor ipſe mori!"

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END OF THE WORK.

T. Bensley, Printer, Bolt-court, Fleet-street, London.